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Consolidation in the Medical Care Marketplace

A Case Study from Massachusetts

Jason R. Barro and David M. Cutler

1.1 Introduction

“Merger mania” is sweeping the health care industry. Hospitals are merging with other hospitals. Hospitals are purchasing or merging with physician practices. Insurers are merging with other insurers. Why are these consolidations occurring? What are their implications for consumers, employers, and the government? In this paper we start to address these questions. Because so little is known about health care consolidation, we focus on consolidation in a particular state—Massachusetts—and largely on the hospital sector. Hospital consolidation in Massachusetts has been as rapid as anywhere in the country. Between 1980 and 1996, two-thirds of the state’s 108 acute care hospitals were involved in some type of merger or contractual affiliation, as were many physicians and a number of insurers. We analyze the Massachusetts experience using standard economic tools as well as a set of interviews of virtually all of the major hospitals in the Boston area. Our results cannot be generalized to the nation as a whole, but they do tell us about consolidation in a situation where it has been pervasive.

The fundamental factor driving health care consolidation, we argue, is managed care. Traditional health insurance was very generous. It paid

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providers on a fee-for-service basis; it did little to control utilization; and it allowed patients unlimited access to the providers of their choice. Managed care changes all that. Managed care policies typically pay primary care physicians a fixed amount per enrollee (“capitation”), making the provider bear all of the marginal cost of services. They require patients to see a primary care physician (“gatekeeper”) before getting a referral to a specialist. And they set up a network of “preferred” providers (physicians, hospitals, and pharmaceutical companies) who accept much lower fees from insurers in exchange for having access to the insurance pool. More generally, this phenomenon of an exogenous shock by health maintenance organizations (HMOs) causing a consolidation wave is not necessarily unique to the hospital industry. The defense industry in recent years probably fits this model as well.

Managed care has spurred provider consolidation in three primary ways. The first effect we term *consolidation for closure*. Managed care—along with technological innovation in medicine more generally—has reduced the demand for inpatient hospitals substantially. Between 1980 and 1994, admissions to Massachusetts hospitals fell by 0.8 percent annually and inpatient days fell by 3.5 percent annually. By any assessment, hospital capacity in Massachusetts (and the nation as a whole) was substantially above demand. Some hospitals have closed outright, while others have merged to facilitate, or substitute for, closure.

The second effect we term *consolidation for economies of scale*. Access to managed care networks is guaranteed largely on the basis of cost. Low cost providers will be better positioned to join networks than high cost providers. In many cases, overall costs can be lowered through hospital mergers. Fixed costs of administrative services, laboratories, or specialized clinical facilities, for example, require a minimum scale to be efficient. Particularly as hospital admissions fall, mergers to achieve these economies of scale have become more common.

The third effect we term *consolidation for network creation*. The cottage industry of local hospitals and physicians in each town is giving way to the regionalization of medical care. To improve their bargaining position with insurers, hospitals want to be part of bigger networks. To ensure access to patients, hospitals want to affiliate with primary care physicians and hospitals in outlying areas. The medical market is moving toward a position of large provider networks, potentially three to five in major cities, that consist of hospitals, primary care physicians, and specialist groups.

In the remainder of the paper, we document the role of health care consolidation in closures, economies of scale, and network creation and consider the implications of mergers for health care costs and patient outcomes. We begin in section 1.2 with a discussion of the terminology of consolidation. In section 1.3 we discuss the growth of managed care and

show trends in patient care. Section 1.4 discusses the rationales for consolidation. Section 1.5 shows aggregate trends in consolidation in Massachusetts, and section 1.6 presents a series of case studies. Section 1.7 looks at some of the implications of mergers for medical care costs. Section 1.8 concludes.

1.2 Definition of Terms

Hospital consolidations encompasses a range of different factors. Because health care is so local—a laboratory three blocks away is practically useless for an emergency patient—not all consolidations can involve the same changes. We differentiate consolidations along three lines.

The first type of consolidation is an agreement to coordinate on medical treatments. For example, two hospitals can set up a joint seminar to learn about patient care or can agree to transfer patients back and forth in a specified way. This type of consolidation is not our primary concern.

The second type of consolidation is an agreement to negotiate jointly with third parties. For example, hospitals might agree to purchase inputs together or to negotiate together with insurers. This type of consolidation was contemplated in Boston before mergers became widespread.

Neither of these first two types of consolidation involves the combination of production activities. Perhaps the most extreme form of consolidation is the complete closure of a medical facility, with all of its services being consolidated into other hospitals. We define a *closure* as an acute care facility's closing or converting such that it is no longer an acute care facility. "Acute care" means a general medical and surgical hospital as defined by the American Hospital Association. A conversion would be if an acute care facility became a rehabilitation center or an elderly care facility, and conversions as well as situations where the building is no longer used in the medical care industry are all considered to be closures.

There are many situations where there is a partial combination of services between facilities with all involved facilities remaining open. We define a *merger* as a consolidation of at least some aspects of hospital production. Mergers can occur at several different levels. The easiest type of merger is an *administrative merger*. This involves combining the nonpatient aspects of the hospitals—billing, information services, purchasing, facilities and maintenance, and so forth.

Administrative mergers are relatively easy because there is no need for the hospitals to be physically close to one another. If the hospitals are close in proximity, they can merge along several other dimensions: *ancillary services* such as laboratories, x-ray machines, magnetic resonance imaging (MRI), and so forth; *nursing staff*; and *clinical services* such as medical/surgical units, emergency rooms, and obstetrics units.

The degree to which these services can be merged depends on the exact

physical structure of the hospitals. Services such as organ transplantation or obstetrics can be combined at one institution even if the hospitals are several miles apart, since there is typically sufficient time to move patients back and forth between institutions. Core services such as laboratories or radiology cannot be far apart from general medical and surgical units, however.

Very few mergers involve full integration of two hospitals into one facility, although many merged institutions claim they intend to move toward this type of integration. Determining the implications of steps short of full integration is extremely important and is a subject we pay close attention to.

To get a sense for what economies of scale are possible, table 1.1 shows a breakdown of hospital employees by type in 1988. The average hospital had roughly one thousand employees, of which close to one-half were not involved with patient care (laundry, cafeteria, custodial staffs, etc.), another third were nurses, and the residual were administrators, technical workers and physicians. Economies of scale seem quite possible. An average hospital had a total budget of \$100 million in 1994, of which approximately 50 percent came from labor expenses. If a hospital could cut 10 percent of its labor force, it would save approximately 5 percent of total spending.

1.3 Trends in the Medical Care Industry

Before considering health care consolidation, we begin with a discussion of the changes that are taking place in the delivery of medical services and health insurance. Traditional insurance was very generous for providers. Reimbursement was on a fee-for-service basis, so that every additional test or procedure brought in additional income. Providers had complete say about what treatments they thought were appropriate, with few controls on utilization. And patients paid very little at the time they used services, giving them little incentive to monitor the care they received.

The result was an industry that expanded far beyond the level of truly necessary services. The expansion was in two directions. First, specialist care became dominant over primary care. Why see an internist for chest pains when a cardiologist is around and can be seen at little additional cost? Since specialists tend to perform procedures related to their specialty more frequently than do generalists seeing similar patients (Greenfield et al. 1992), the result was high levels and rapid growth of medical services. In addition, hospitalizations became frequent and lengthy. Marginal cases were generally hospitalized, and people admitted to hospitals tended to stay there for long periods of time to make sure everything was OK.

Further, because health care is primarily a local good, the industry developed a local orientation. Practically every community had local

Table 1.1 Distribution of Hospital Employment, 1988

Area of Hospital	FTEs	FTEs/Bed	FTEs/Bed		
			Less Than 100 Beds	100–300 Beds	More Than 300 Beds
Doctors	56	.25	.06	.04	.47
Nurses	305	1.38	1.30	1.19	1.55
Administrators	23	.1	.12	.10	.10
Technical workers	88	.4	.39	.38	.41
Dietitians	8	.04	.08	.03	.04
Social workers	7	.03	.02	.02	.04
Psychologists	2	.01	.003	.005	.01
Other	501	2.26	1.56	1.71	2.85
Total	988	4.59	3.66	3.61	5.58

Source: American Medical Association 1988 Annual Survey of Hospitals.

physicians and hospitals, which were the entry points to the medical system along with specialized, high-tech hospitals in big cities. Figure 1.1 shows the distribution of acute care hospitals in Massachusetts in 1980—a year roughly at the high-water mark for the hospital industry. Each dot in the figure is an acute care hospital.¹ There were 108 acute care hospitals in 1980. Many towns had one or two community hospitals or were near a town that had one. The map also indicates which of the 1980 acute care hospitals are no longer acute care hospitals today. The smaller symbols indicate that the hospital closed before 1996.

We divide the hospitals in the state into five groups (differentiated on the map): 24 hospitals were located in major cities;² 53 hospitals in suburban areas immediately surrounding these major cities;³ 12 hospitals in smaller cities;⁴ 12 hospitals in suburbs of these smaller cities; and 7 hospitals in rural areas.

Because towns took great pride in their hospitals, and hospitals were such an important local institution, medical cultures developed quite locally. Patients and physicians in neighboring towns or across the street might each see their hospital as the better institution. The most difficult aspect of hospital mergers, in many cases, are these cultural issues.

The past few years have seen a dramatic reversal of these trends (see Zelman 1996 for an overview). Most prominent in the reversal is the rise of managed care insurance.⁵ One fundamental difference between managed care and traditional insurance is that managed care insurers generally do not pay providers on a fee-for-service basis. Primary care physicians, for example, are typically capitated—they receive a fixed amount per patient per month, independent of actual services provided. Hospitals and specialists are generally paid on a fee-for-service basis, but there are often financial incentives facing the specialist and the primary care physician to encourage lower utilization. For example, primary care physicians might get additional income if hospital utilization rates remain low, or hospital payments could depend on utilization rates. As a result, there are substantial incentives toward reduced utilization of medical care, particularly hospital and specialist care (Cutler 1995).

1. Acute care means that the hospital is a general medical or surgical hospital, as defined by the American Hospital Association. The primary medical institutions excluded by this definition are psychiatric and rehabilitation hospitals.

2. Major cities are Boston, Springfield, and Worcester.

3. We define a suburb loosely as a town near a city. Large towns near larger cities are considered suburbs rather than their own city. For example, Cambridge is considered a suburb of Boston.

4. The smaller cities are Lawrence, Lowell, New Bedford, Fall River, Fitchburg/Leominster, and Pittsfield.

5. The lexicon of managed care has traditionally been divided into such terms as health maintenance organizations (HMOs), preferred provider organizations (PPOs), and independent practice associations (IPAs), but for our purposes the terminology is less important than the economic effects.

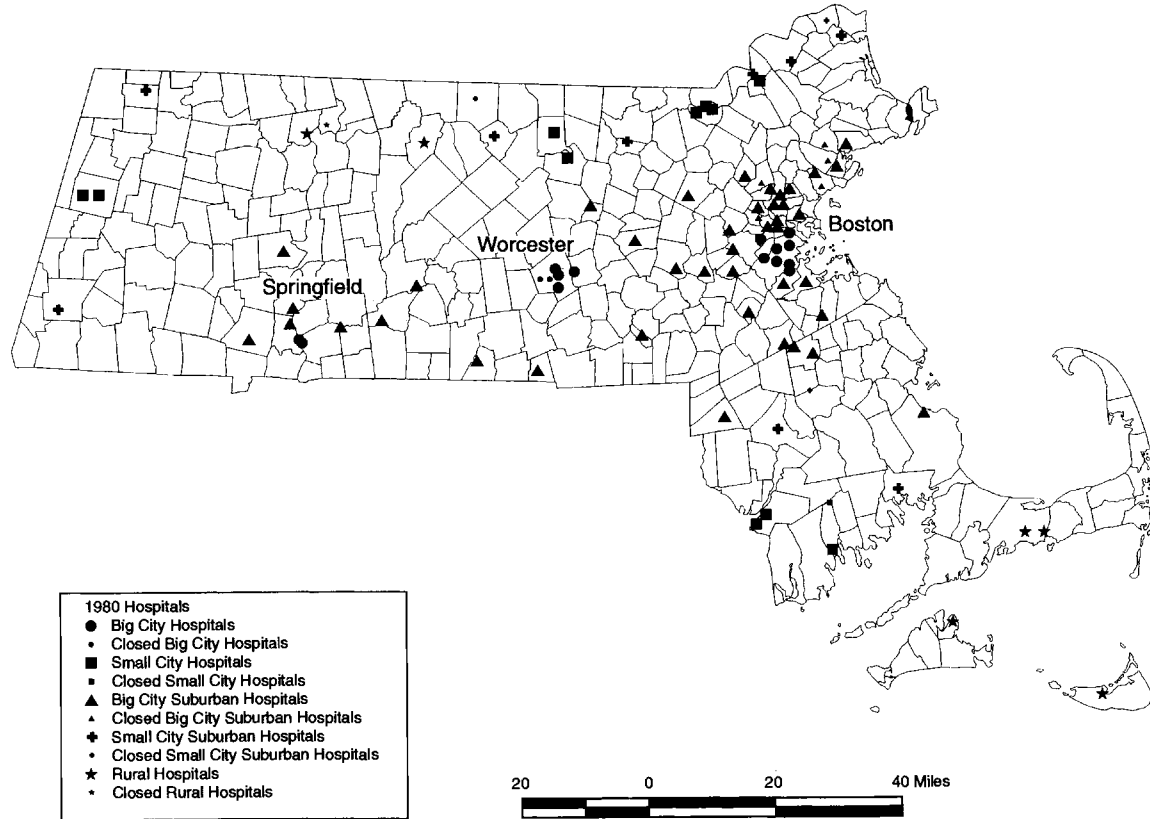


Fig. 1.1 Massachusetts acute care hospitals, 1980

Financial pressures are not limited to private insurance but have become most extensive there. Beginning in fiscal year 1984, for example, Medicare moved to paying hospitals on a per-case basis, much the way managed care does now. Medicaid followed as well, and managed care is an increasing part of both of these programs. But the dominant effect for providers has been managed care in the private sector.

In addition to its financial restrictions, managed care removes equal choice of providers. Managed care insurers set up a “network” of providers who agree to lower fees in exchange for access to the network. Patients are steered toward the network providers by increasing the cost sharing required for out-of-network usage. A typical plan, for example, might charge a ten dollar copayment if the person uses a network provider but require a five hundred dollar deductible and 20 percent coinsurance for care received outside of the network.

Even within the network, moreover, patients do not have free choice of providers. Most managed care insurers use the primary care physician as a “gatekeeper”—care from specialists will only be available if the primary care physician has authorized it. Limiting access to medical specialists limits the use of expensive, high-tech medical care.

Finally, managed care insurers bargain strenuously with providers. Because access to the network is so important and managed care limits the network substantially, managed care insurers receive rates far below what non-managed care insurers are paying. No systematic evidence on payment rates across insurers is available, but our informal conversations suggest that a large managed care insurer can pay up to 30 percent below insurers without a tight network.

Managed care is a large and growing part of the health insurance marketplace (Cutler, McClellan, and Newhouse 1996). Figure 1.2 shows the expansion of managed care into Massachusetts and the nation as a whole between 1984 and 1994. The figure shows just one part of managed care—closed panel HMO enrollment. Other types of insurance such as preferred provider organizations (PPOs) and looser forms of HMOs do not have data that extend back as far. Even with this restriction, more than a third (34.5 percent) of the Massachusetts population was enrolled in an HMO in 1994. This is triple the rate a decade earlier and over twice the national average. Massachusetts thus seems to be a natural case study for examining the impact of managed care on the medical marketplace.

1.4 Trends in the Hospital Marketplace

Managed care is not the only factor affecting the hospital marketplace, although it is a dominant one. The movement of Medicare and Medicaid to a per-admission payment basis reduced the intensity of medical treatment substantially (Feder, Hadley, and Zuckerman 1987). And technologi-

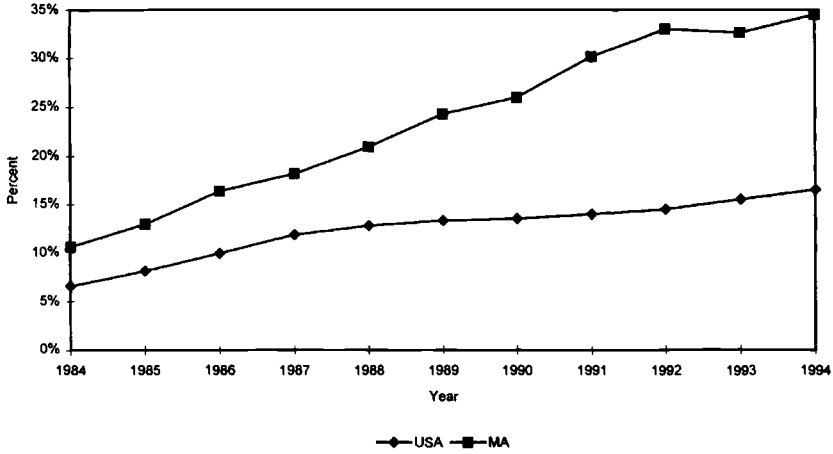


Fig. 1.2 HMO penetration, 1984-94

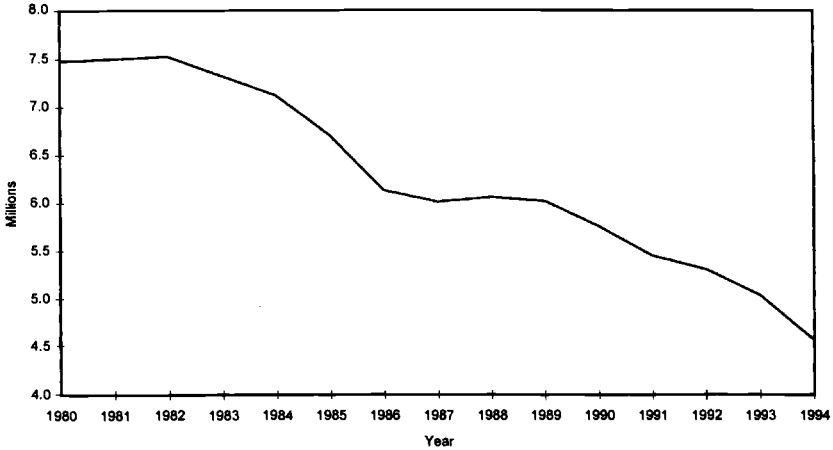


Fig. 1.3 Trend in inpatient days in Massachusetts acute care hospitals

cal change has also reduced the demand for inpatient care. In the early 1980s, for example, the typical cataract surgery operation involved several days in the hospital. By the late 1980s, essentially all cataract surgeries were done on an outpatient basis. Treatment of ulcers used to require surgery, but better knowledge of gastrointestinal processes has led to the development of pharmaceutical methods of treatment. The net effect of all of these factors has been a substantial reduction in the demand for inpatient hospitals.

The demand reduction has been dramatic. Figure 1.3 shows the trend in inpatient days in Massachusetts hospitals. Between 1980 and 1994, in-

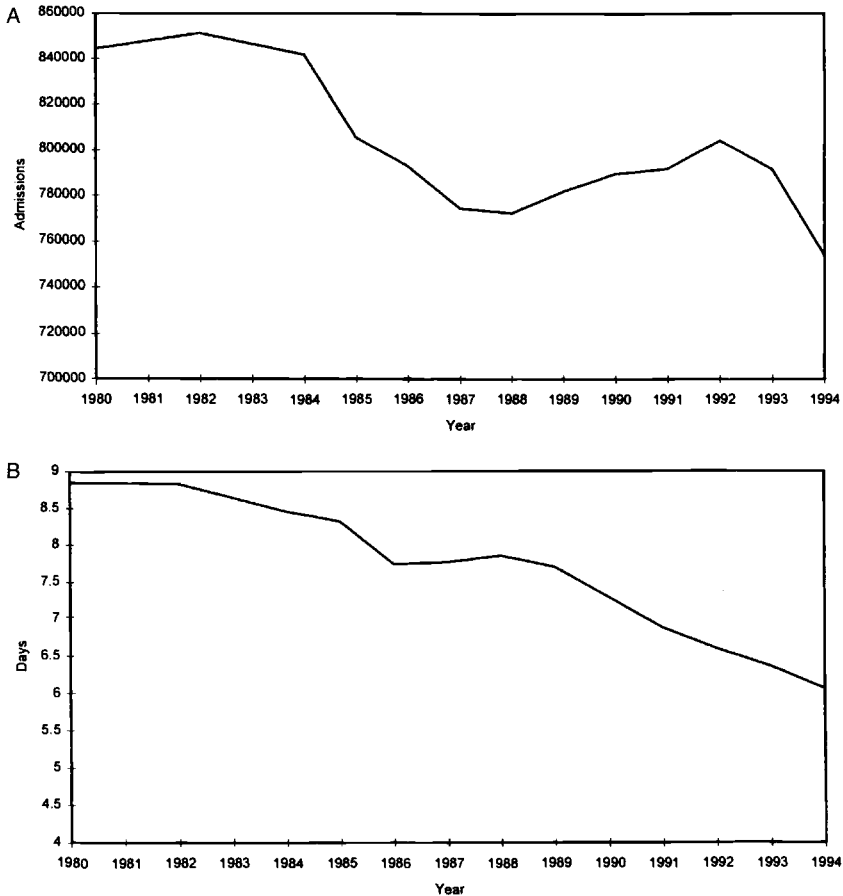


Fig. 1.4 Trends in hospital admissions in Massachusetts (A) and average length of stay in Massachusetts acute care hospitals (B)

patient days have declined by 3.5 percent annually, even with a growing and aging population. This decline is so dramatic that by the turn of the century, inpatient hospital utilization will be roughly 50 percent of its level in 1980. Indeed, a common estimate among market participants is that long-run demand will be 50 percent or less of its peak level.

Figure 1.4 decomposes the change in inpatient days into changes in the number of admissions and changes in the length of stay per admission. Both have fallen over time. Admissions fell by 1.1 percent annually between 1980 and 1994, and length of stay fell by 2.2 percent annually. The reduction in average length of stay is particularly notable since most research suggests that the pool of patients being admitted to hospitals is sicker now than it used to be (Cutler and Staiger 1996).

The reduction in inpatient demand has had three implications for the organization of the medical system.

1.4.1 Consolidation for Closure

Clearly, demand reductions of this magnitude cannot be met without substantial hospital closures and downsizing of surviving hospitals. The first implication of managed care has therefore been to force a contraction of inpatient beds. We term this implication *consolidation for closure*.

Some hospitals have closed outright. Smaller hospitals without strong ties to particular local communities, for example, are generally the first to close. Figure 1.5 shows the drop in the number of acute care hospitals in Massachusetts.

But it is often difficult for hospitals to close. The community and cultural factors noted above make people want to preserve their access to nearby, neighborhood health care and make providers eager to ensure continuity of this access. In such circumstances, hospital mergers are often a way to facilitate, or substitute for, closure. For instance, for a community that has had two hospitals but now only needs one, merging may make it easier for the combined institution to shut down one of the physical buildings and move operations to the other. The building may move out of the medical sector entirely (as happened in Lynn, where the old hospital was razed and converted into a supermarket). Or the facility may be converted into a psychiatric hospital, rehabilitation hospital, nursing home, outpatient center, or similar service (as happened in Winthrop where Boston University Medical Center purchased Winthrop Community Hospital and converted it into an outpatient facility).

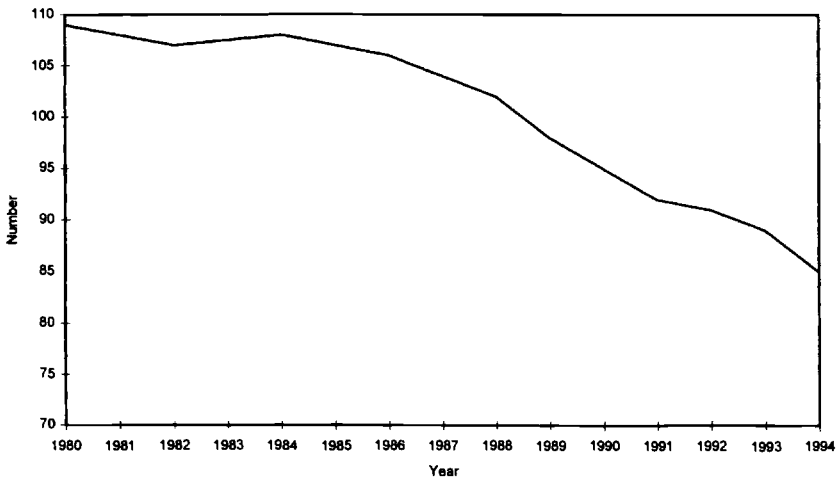


Fig. 1.5 Number of acute care hospitals in Massachusetts

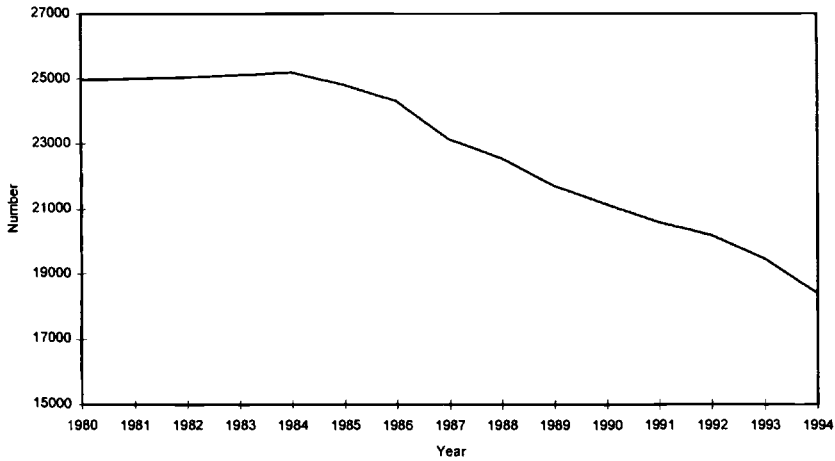


Fig. 1.6 Number of beds in acute care hospitals in Massachusetts

Alternatively, merging hospitals can reduce the inpatient supply of each hospital but maintain both physical institutions as acute care facilities. This is what occurred in Framingham and Natick, where both local hospitals remain open but at substantially lower capacity than before.

A reduction in hospital beds has indeed occurred. Figure 1.6 shows the number of acute care hospital beds from 1980 to 1994. Inpatient capacity has fallen by 30 percent. This is near the reduction in hospital days, although a bit smaller. It seems that further facility closure will be needed.

Managed care penetration varies considerably across different states, and one may therefore expect consolidation for closure to differ across states as well. Indeed, California, which along with Massachusetts has high managed care penetration, has also seen a large number of hospital closings and consolidations. In future research, we intend to examine how much of hospital closings nationwide results from managed care.

1.4.2 Consolidation for Economies of Scale

The second implication of managed care is to increase the emphasis on cost savings. In addition to closing or curtailing services, hospitals have incentives to provide care more efficiently. Mergers can help hospitals realize efficiency savings. This is particularly true as demand is falling. A hospital that was producing at minimum cost with four hundred beds may be above minimum cost if it falls to two hundred beds. In order to reduce average costs, the hospital may need to merge. We term this rationale *consolidation for economies of scale*.

As noted above, hospitals can merge at several levels. Hospitals can combine their administrations, their ancillary services (laboratories, x-rays, etc.), nursing services, and their entire medical services. The ease

with which hospitals can combine each of these levels decreases after administrative and ancillary, and increases as the distance between the hospitals becomes smaller. Hospitals that are not located next to each other cannot share certain facilities such as laboratories or cafeterias. Recent mergers have run the gamut of these possibilities.

1.4.3 Consolidation for Network Creation

The third implication of managed care is somewhat more subtle. As managed care has increased in importance, the value of being part of a larger network has increased as well.

Networking regionally meets two needs. First, it is a way to secure access to patients in a market with falling demand. Patients are generally not loyal to insurance companies (other than the government), but they are very loyal to their doctor (witness the advertising on television and radio). Given that hospitals need patients, that patients value stable provider contacts, and that patients are increasingly affiliating themselves with primary care physicians, the key to ensuring a continuous stream of patients is to affiliate with primary care physicians. Hospitals' buying or affiliating with primary care practices or community hospitals to meet this demand has become a substantial market.

Specialists are less well positioned than are primary care physicians in this market, in part because specialists have much higher costs than primary care physicians, and in part because the relative supply of specialists is so much greater than the relative supply of primary care physicians. Thus, affiliations between hospitals and specialists are a much smaller part of the managed care revolution.

Networks also increase the bargaining power of providers relative to insurers. For small hospitals, the reality is that managed care insurers will not even bother to contract with a small hospital that does not offer the full range of services. As a merged institution, two small hospitals can offer a complete medical package to insurers that the two separately might not be able to support.

Large hospitals can also gain by merging. Even large hospitals face price pressure from insurers. If hospitals can affiliate with enough other hospitals so that an insurance company could not conceivably offer a plan to its customers without access to those hospitals, then the balance of power shifts toward the hospitals and the contracts become more favorable.

1.5 The Massachusetts Experience

To examine how these various trends have played out, we look in detail at the recent history of consolidation in Massachusetts. Our data on consolidation and its outcomes are from the Massachusetts Hospital Association and the American Hospital Association.

Table 1.2 shows the number of hospitals involved in at least one

Table 1.2 Hospital Consolidation in Massachusetts

Years	Number of Hospitals Beginning	Consolidations				Hospitals without Consolidation
		Closed, No Merger	Merged		Still Acute Care	
			Immediate Closure	Future Closure		
1980–85	108	3	1	2	8	94
1985–90	104	5	4	1	11	73
1990–92	93	0	1	0	8	64
1992–94	91	0	4	0	18	42
1994–96	87	0	0	0	11	31
Total	108	8	10	3	56	31

Source: Massachusetts Hospital Association.

consolidation over time. We divide consolidations into two broad types: closures without any prior affiliation with another hospital and mergers.⁶ A merger need not be the end of the story. We subdivide mergers by what happened to the original hospital building: immediate closure, closure in the future, or survival as an acute care institution.

Closure has been an important part of hospital consolidation. Of the 108 acute care facilities in Massachusetts in 1980, 8 closed without any prior consolidation activity, and 13 closed subsequent to a merger. Thus, there has been a net reduction of 20 percent (21/108) in the number of acute care hospitals. Three-quarters of the hospitals that have closed either closed or first merged with another hospital in the 1980s. This fact suggests that there were stronger and weaker hospitals in 1980, and that the first effect of falling demand is to force the weaker institutions to leave the market.

In addition to the hospitals that closed, another 56 hospitals merged with another institution and remain open as inpatient facilities. This type of consolidation has increased over time, from roughly 2 per year in the 1980s to 6 per year in the 1990s. Nearly all of the mergers of large hospitals are later in the period (Partners, CareGroup, Columbia/HCA).

All told, 69 percent of the hospitals in Massachusetts have closed or been involved in some kind of consolidation since 1980; only 31 institutions have neither closed nor merged with another hospital (and many of these are the subject of consolidation rumors).

The extent of consolidation, and the form that consolidation takes, differs along two dimensions. The first is the hospital's location within the state. The upper panel of table 1.3 shows the rate of consolidation by hospital location. Consolidation is more common in cities than in suburbs or rural areas. Seventy-five percent of big city hospitals and 83 percent of small city hospitals have engaged in some consolidation, compared to 60 or 70 percent of other hospitals.

The form of consolidation differs as well. Closure—whether coupled with a merger or not—is more common in big cities or their suburbs than in other areas of the state. In big cities and their suburbs, 21 percent of the hospitals in 1980 ultimately closed, compared to 16 percent of hospitals in other areas. Merger without closure, in contrast, is about equally likely in all of the areas.

The second dimension is the size of the institution. The lower panel of table 1.3 shows the rate of consolidation by the number of beds in the hospital in 1980. Smaller facilities are much more likely to consolidate than are larger facilities. Eighty percent of hospitals with less than one hundred beds underwent some form of consolidation, compared with 67 percent of large hospitals. The biggest difference is in the likelihood that

6. Mergers are sometimes differentiated into holding company mergers, acquisitions, and contractual arrangements, but we do not view this distinction as particularly relevant.

Table 1.3 Consolidation by Hospital Location and Number of Beds

Characteristic	Number of Hospitals, 1980	Percent Consolidating	Percent Closing	Percent Merging without Closure
Total	108	71	19	52
Location				
Big city	24	75	21	54
Suburb of big city	53	68	21	47
Small city	12	83	8	75
Suburb of small city	12	67	25	42
Rural	7	71	14	57
Number of beds, 1980				
Less than 100 beds	25	80	52	28
100–300 beds	56	70	10	59
More than 300 beds	27	67	7	59

Note: Big cities are Boston, Springfield, and Worcester. Small cities are Lawrence, Lowell, New Bedford, Fall River, Fitchburg/Leominster, and Pittsfield. Suburbs are generally defined as towns in close proximity to large cities. Small cities very close to large cities are considered suburbs, rather than their own city (e.g., Cambridge is a suburb of Boston). Fig. 1.1 shows the distribution of hospitals by location.

a hospital will close. Over half of the small hospitals in Massachusetts in 1980 were no longer acute care facilities by 1996. Hospitals with less than one hundred beds in 1980 accounted for approximately one-fourth of the acute care hospitals, and yet 62 percent of the closures came from that group.

But the downsizing of the industry is more than just hospitals closing. As table 1.4 shows, even those hospitals that are still acute care institutions have seen reductions in the number of inpatient beds. Both those that consolidated and those that did not consolidate have reduced their inpatient beds by roughly 20 percent. As the last row of the table shows, only one-third of the reduction in inpatient beds has been a result of hospital closures; the remaining two-thirds represents downsizing among existing institutions.

A hospital involves a certain amount of physical space, and one might wonder what hospitals do with the space when it is no longer in use serving acute care patients. Table 1.5 presents data on this question. Generally, areas of the hospital that are no longer in use for acute patients are converted to subacute use—rehabilitation facilities, nursing home services, and psychiatric services. Between 1980 and 1994 the share of beds in acute care facilities that were rehabilitation beds rose from 0.3 percent to 1.1 percent, while nursing home beds and psychiatric beds rose even more substantially, from 0.2 to 4.3 percent and 0.3 to 7.2 percent, respectively. The shift of acute care institutions to subacute care services is one of the hallmarks of hospital consolidation.

Table 1.4 Change in Average Number of Beds by Hospital Location and Consolidation

Location	Year	Consolidation			Average
		Closed	Still Acute Care	No Consolidation	
Big city	1980	132	502	307	376
	1994	—	413	258	364
Suburb of big city	1980	122	202	219	191
	1994	—	164	175	166
Small city	1980	116	277	327	272
	1994	—	205	226	208
Suburb of small city	1980	51	142	167	128
	1994	—	124	138	130
Rural	1980	82	153	67	118
	1994	—	135	65	111
Average change (%)		—	-21	-22	-10
% of total change		35	44	21	100

Note: Location definitions are given in table 1.3.

Have these mergers been largely for closure, economies of scale, or network creation? It is difficult to say *ex ante*, and more than one may be at work in any particular case. We can give some sense of this by looking at the extremes. Given the reduction in the number of hospitals, consolidation for closure seems quite important. So does consolidation for economies of scale. In several mergers, the two hospitals were physically joined.

But these are only crude estimates. We try to get a better sense of why some hospitals are merging in the next section by analyzing a series of case studies.

1.6 Case Studies

In this section, we consider how some of the mergers that have occurred in Massachusetts fit into our typology above. We focus on five mergers in particular, which are detailed in table 1.6: (1) the merger of Brigham and Women's Hospital and Massachusetts General Hospital to form Partners Health Care (1993); (2) the merger of Beth Israel Hospital, the Pathways Group (built around the Deaconess), and Mount Auburn Hospital to form CareGroup (1994 and 1996); (3) the merger of Boston City Hospital and the Boston University Hospital to form Boston Medical Center (1996); (4) the merger of Framingham Union Hospital and Leonard Morse Hospital to form MetroWest (1991), and its subsequent acquisition by the for-profit Columbia/HCA chain (1996); and (5) the merger of Union Hospital and Lynn Hospital to form AtlantiCare (1985).

We chose these mergers because we felt they represent a good cross

Table 1.5 **Distribution of Hospital Beds by Type of Bed and Institution**

Location	Year	Total	Non-Acute Care Services			
			Rehabilitation	Nursing Home	Psychiatric	Other Subacute
Acute care institutions	1980	25,005	65	50	64	77
	1994	19,914	215	813	1,364	296
Percent of acute care beds	1980	--	0.3	0.2	0.3	0.3
	1994	--	1.1	4.3	7.2	1.5

Note: Acute care institutions are defined as general medical and surgical facilities by the American Hospital Association.

Table 1.6 Summary of Consolidation Case Studies

Consolidation	Year	Number of Beds		Type	Rationale
		1980	1994		
Partners (Boston)	1993			Single parent	Network formation
Massachusetts General Hospital		1,092	899		Economies of scale (administration)
Brigham and Women's		655	712		
Total beds		1,747	1,611		
CareGroup (Boston)	1993-96			Full integration (BI/Deaconess)	Economies of scale
Beth Israel		452	447		Network formation
N.E. Deaconess		489	314		Closure
Mount Auburn		300	279		
N.E. Baptist		245	173	Single parent (Others)	
Waltham		311	206		
Nashoba		102	59		
Glover		101	58		
Total beds		2,000	1,536		
Boston Medical Center (Boston)	1996			Full integration	Economies of scale
Boston City Hospital		454	282		Closure
Boston University Hospital		379	311		Network formation
Total beds		833	593		
MetroWest (Framingham)	1991, 1996			Full integration (MetroWest)	Economies of scale
Framingham Union		311	469		Closure
Leonard Morse		259		Takeover (Columbia)	Access to capital
Total beds		570	469		Debt relief
AtlantiCare (Lynn)	1985			Full integration	Closure
Union Hospital		210	318		Economies of scale
Lynn Hospital		305			Debt relief
Total beds		515	318		

Note: Rationale for merger drawn from hospital interviews.

section of the different types of consolidations occurring in the Boston area. Partners and CareGroup are large health care networks. Boston Medical Center brings a concern about public hospitals and the implications for the poor. AtlantiCare and MetroWest are smaller suburban hospitals, where survival is more of a concern.

Our analysis is based on both economic evidence and detailed interviews with hospital executives from all of these consolidations. In each case, our interviews lasted about one and one-half hours and covered the history of mergers at that institution and in the state as a whole. All of the institutions that we approached agreed to speak with us.

Table 1.6 gives a brief summary of each consolidation. The table shows the number of beds in each of the hospitals in 1980 and 1994 and provides an overview of the rationale for the merger. The mergers that we examine represent a large share of the Massachusetts hospital industry. In 1980, for example, these institutions accounted for 23 percent of the state's 25,005 hospital beds in acute care facilities.

1.6.1 Partners Health Care

The Partners merger, agreed to in 1993, was the most important hospital consolidation in Massachusetts, if not the country, at the time. The merger brought together Massachusetts General Hospital and Brigham and Women's Hospital, two of the five leading downtown teaching hospitals (the others were Beth Israel, New England Medical Center, and Boston University Medical Center). The merger sent shock waves throughout the rest of the market. Indeed, a fair part of the subsequent merger activity in the Boston area was a response to the Partners merger.

The first thing to note about this merger, as shown in figure 1.7, is that Massachusetts General Hospital and Brigham and Women's Hospital are not near each other. Massachusetts General Hospital is close to downtown Boston, while Brigham and Women's Hospital is located in the Longwood Medical Area, a dense concentration of hospitals near the Boston-Brookline border. The two hospitals are located three miles apart, a drive of perhaps twenty minutes. Thus, complete integration is not the goal of the merger. The only way that would be feasible would be to move the operations from one facility over to the other.

The Partners merger is primarily a merger for network creation. At one level, the new institution is so prestigious that most insurers virtually cannot afford not to contract with it. This improves substantially Partners' bargaining position with insurers. At another level, Partners has a strategy of affiliating with many physician groups in the periphery as well as setting up local ambulatory clinics in suburban areas, to extend the hospitals' patient base.

Having a combined institution makes it easier to engage in this practice, in part because the financial resources of the combined institution are

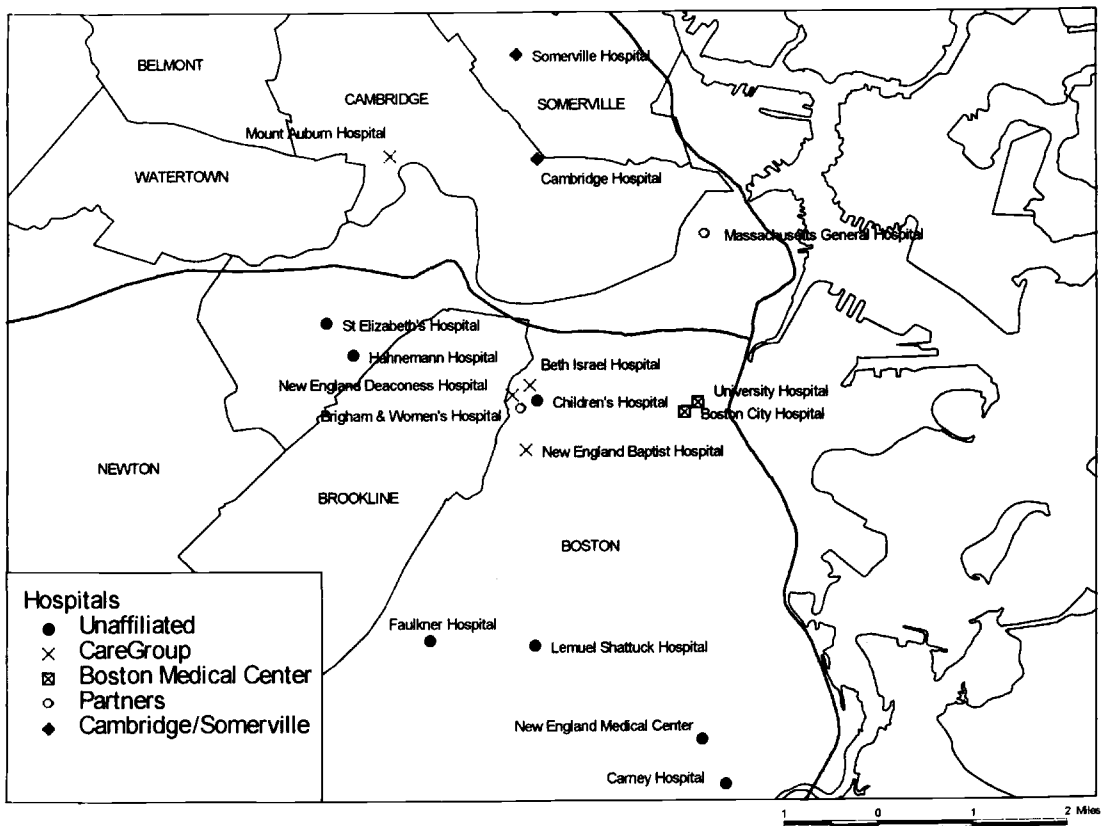


Fig. 1.7 Downtown Boston affiliations

much greater. Indeed, this strategy was aided by the fact that, prior to the merger, the two hospitals had primarily drawn patients from different parts of the city (Brigham and Women's to the north; Massachusetts General to the south), so that market share among the two hospitals was complementary.

Part of the Partners merger is also for economies of scale, but these are largely administrative savings. For example, there are goals of consolidating the information services departments, as well as human services and building and construction. The lack of full clinical integration is not particularly surprising given the physical distance between the two institutions. But even the services that might be consolidated are not being consolidated. For example, Massachusetts General Hospital went ahead with its plans to build a new obstetrics unit after the merger, even though Brigham and Women's has perhaps the preeminent obstetrics unit in the country. This was seen as some evidence that the merger between these institutions is more difficult than had been thought originally.

Finally, as is relatively obvious, the Partners merger was not a merger for closure. The current combined institution is financially strong, even stronger than the hospitals themselves expected. Part of the reason for that may be that the new network has been successful in increasing their customer base even in an overall declining market. The continued financial strength has put little pressure on Partners to close or consolidate any services. This does not mean that the hospitals have not reduced their scale. Table 1.6 shows that between 1980 and 1994, the two hospitals combined reduced their bed capacity by 8 percent. This is not nearly as large as many other reductions, but it illustrates that even the most powerful hospitals in the market realized the need to downsize.

1.6.2 CareGroup

CareGroup is the result of a three-way merger between Pathways—which was Deaconess Hospital's fledgling network—Beth Israel Hospital and Mount Auburn Hospital. Beth Israel and the Deaconess were perhaps hospitals number three and four in the Boston market prior to the consolidations. Geographically, Beth Israel and the Deaconess are right next to each other in the Longwood area (in fig. 1.7, they are the two X's directly north of Brigham and Women's Hospital). Mount Auburn (also indicated with an X) is in Cambridge, to the northwest and across the Charles River from the two central hospitals.

Beth Israel and the Deaconess had each held out hope of affiliating in some way with either Massachusetts General Hospital or Brigham and Women's Hospital prior to the Partners merger, and the hospitals spent the three years after that shock trying to solidify their positions as powerful Boston area teaching hospitals.

There are two fundamentally different events taking place in Care-

Group. The first is the integration of Deaconess and Beth Israel. Beth Israel and the Deaconess are going to become one institution. The name has been changed to the Beth Israel Deaconess Hospital; they are appointing only one service chief for each department; and they are going to physically relocate parts of the two institutions to combine activities such as emergency rooms, obstetrics, and so forth. Indeed, the hospitals have gone so far as to plan a bridge to connect the two facilities. Full consolidation may take several years, but the hospitals envision a single, unified institution. This part of the merger appears to be for economies of scale: the hospitals envision large cost savings from eliminating duplicative services.

The second factor involved is the network that the combined institution is forming. This is the primary rationale for keeping the other (smaller) hospitals with Beth Israel Deaconess. Mount Auburn and New England Baptist (one of the former Pathways members) are the more substantial of these other hospitals, but as table 1.6 shows Deaconess and Beth Israel as a combined institution dwarf the other members of the network. Several of the other hospitals (they are outside the map boundaries of fig. 1.7) will, in all likelihood, survive as acute care facilities; it is generally less expensive to provide routine care outside of the major downtown center. The future of the smaller suburban hospitals in areas where demand has fallen substantially, however, is more perilous.

Table 1.6 shows the extent to which CareGroup has already reduced its size. In 1980, the hospitals making up CareGroup actually would have been larger than Partners. By 1994, however, the combined institution is smaller, having cut a quarter of their inpatient beds.

CareGroup's strategy of maintaining suburban hospitals contrasts with the Partners strategy of affiliating with doctors but not hospitals. Of course, if there is only one local hospital, having affiliated with either the doctors or the hospital is equivalent to having affiliated with both. But more generally, there is a debate about the right strategy for interaction of the powerful, downtown hospitals and the weaker, suburban communities that these two strategies reflect.

1.6.3 Boston Medical Center

Boston Medical Center is the result of a merger between Boston City Hospital and Boston University Hospital. As with the Deaconess-Beth Israel merger, University Hospital and Boston City Hospital are physically adjacent to each other, making it feasible for the two institutions to combine. Figure 1.7 shows the two hospitals isolated in east-central Boston.

The primary reason for the merger appears to be economies of scale. It was clear to everyone involved that with the reduction in inpatient demand, there was no need for two large hospitals located in that part of town. Because the projected size of two scaled-down hospitals would be too small to operate efficiently, merging was the only real option. Table

1.6 shows the extent to which the two hospitals had already reduced their capacity prior to the merger. By 1994, the institutions had cut 34 percent of their inpatient beds. The new hospital expects to shrink even more. The likely outcome is that the new, combined institution will have half as many beds as the two hospitals together had just fifteen years ago.

Boston City Hospital and Boston University Hospital were synergistic in some ways, helping to ease the merger. Boston City Hospital had relationships with community health centers, which meant access to patients. University Hospital never had much affiliation with primary care practices. Surprisingly for a public hospital, Boston City Hospital was in good financial shape, due in large part to generous payments by the state for Medicaid and care for the uninsured. University Hospital, on the other hand, was a private institution, which provided Boston City Hospital a way to remove itself from the controls of city government.

Boston City Hospital and University Hospital had been de facto integrated for several years before the merger. They shared medical staff for at least three years prior to the merger, and the administrative positions had been merged through attrition for several years as well, in anticipation of the consolidation.

The only real problem with the merger was the cultural issues over access for the poor and treatment of the public workers. The workers were largely ignored and the merger was approved despite their objections. The access issue was really a nonissue, as for now the new hospital intends to continue the policy of the old City Hospital, particularly if the city money continues to flow in.

The two hospitals are currently in the process of merging all services into one institution. They are actually planning to close down some of the buildings (the hospitals are a mix of excellent new facilities and decaying older ones) as the institution shrinks.

1.6.4 MetroWest—Columbia/HCA

MetroWest is a story of two mergers. First there was a merger between two small, financially troubled hospitals, Framingham Union and Leonard Morse (Natick), that went very wrong. Second there is the purchase of the resulting hospital by Columbia/HCA, the largest for-profit hospital chain in the country.

MetroWest was created in 1991 by a merger of Leonard Morse Hospital in Natick and Framingham Union Hospital in Framingham (the two towns are adjacent, west of Boston). This merger was largely a form of closure. It was clear to everyone associated with the hospitals that the Framingham-Natick market was not big enough to support two hospitals. The strategy employed by Framingham was to wait for Natick to close, and to actually facilitate that closure by writing contracts with insurance

companies to exclude Leonard Morse. Leonard Morse's strategy was to beg for a merger, which ultimately took place.

The merger was unsuccessful. Part of the difficulty was cultural. Framingham Union was the teaching hospital with the star doctors, while Leonard Morse was the friendly community hospital where the doctors paid attention to their patients. Framingham ignored Leonard Morse after the merger. The physical facility fell into disrepair and the services disappeared. The Natick community was upset, and the local outcry to save Leonard Morse hospital helped to bring about a change of management.

Beyond the cultural issues, the financial health of the new hospital deteriorated. The hospitals continued to lose patients and were in need of capital to improve the physical structure of the two institutions. The decision of the management was that the two hospitals would not be able to survive alone. An outside partner would be needed to provide capital and access to favorable insurance contracts.

As a result, MetroWest was sold to Columbia/HCA. Before that, MetroWest was offered to the other major players in the Boston market, but Columbia was the only hospital that would guarantee to keep both facilities open. The deal allowed each of the institutions, and the hospital as a whole, to survive. Columbia benefited by getting a foothold in the Boston area.

Since the takeover, MetroWest has done better financially. The turnaround in performance under Columbia/HCA is in part a result of cost cutting and in part a result of converting inpatient facilities into more profitable services. The Leonard Morse building, for example, has transitional care units (TCUs), rehabilitation units, and a child psychology facility. TCUs are a way for hospitals to increase Medicare reimbursement.⁷ The result of all of this is that the Leonard Morse facility has almost no unused space in the hospital even though it has seen its patient base decline substantially.

1.6.5 AtlantiCare

AtlantiCare is the story of a town struggling to preserve local, acute-care hospital services. The city of Lynn, a poor, working class community in the North Shore section of the Boston area, once had two hospitals: Union Hospital, which is where the current AtlantiCare hospital is, and Lynn Hospital. Like MetroWest, the two hospitals were more related by geography than culture. Union was more suburban while Lynn was an inner-city hospital, even though the two are within three miles of each other.

7. A patient admitted to the hospital with a hip fracture, for example, will be treated in the hospital unit and the hospital will receive a diagnosis-related group (DRG) payment. Afterward, the patient may be transferred to the rehabilitation unit, and the hospital is paid a per-diem rate for care.

In the mid-1980s, it became clear that two institutions could not survive in the city. The obvious solution was to consolidate hospital services into the nicer facility (Union Hospital); the Lynn Hospital structure was old and substantially depreciated. The merger was predominately one for closure.

The merger was not handled well politically, however, and the town essentially forced the hospitals to consolidate in the poor facility. The result was an exodus of patients and doctors to nearby Salem Hospital. The hospitals learned the hard way that patients are attached to their doctors more than their hospital, and that small community hospitals cannot force doctors or their patients to stay.

Eventually, the hospital relocated to the good facility at Union, but by then a great deal of damage had been done. For example, obstetrics and pediatrics, which had fled for Salem Hospital from the old facility, never returned to the new facility.

It is now clear that even the combined institution cannot survive in the new marketplace. The hospital has cut its costs, but that will not be enough. The key to survival in the long run is access to patients. The North Shore as a whole has a substantial oversupply of beds, and AtlantiCare cannot offer insurers the full-service hospital they desire. Without an additional merger, AtlantiCare is almost certain to close. Indeed, AtlantiCare has tried to merge with each of the networks of the North Shore: the Salem group (which is affiliated with Partners), Beverly, and Lahey (a doctor's hospital in Burlington). None of these have worked out.

1.6.6 Summary

Our case studies document all three roles for mergers. In many cases, mergers are a way of facilitating or substituting for closure. MetroWest and AtlantiCare are prime examples of this. In one case, the merger facilitated closure (AtlantiCare); in the other case, the merger substituted for closure (MetroWest). Fundamentally, however, the two examples are more similar than they are different. The stereotype of this type of consolidation is a smaller hospital in a metropolitan area or the suburban area just surrounding a metropolitan area where demand is falling. In these markets, there is generally an oversupply of hospital beds and patients have the ability to move across institutions. Some form of closure is often the result.

Our case studies also show the potential role of economies of scale, particularly when neighboring hospitals merge. Hospitals can combine two service staffs into one at the administrative level or all the way down to moving departments across facilities. Economies of scale are most important for Boston Medical Center and Beth Israel Deaconess, both of which are consolidating to operate more efficiently. Unfortunately, both mergers are too new to know much about how successful they will be in reducing costs.

But perhaps most strongly, the mergers show the growing regionalization of medical care delivery. The Boston area is building up several large provider networks: Partners, CareGroup, Boston Medical Center, Lahey, and Columbia/HCA (if it enters the city). Each network will be affiliated with suburban physicians and potentially hospitals.

Columbia was recently dealt a blow in its attempts to enter the Boston hospital market when New England Medical Center, the last remaining unaffiliated, major teaching hospital downtown decided to merge with Lifespan, a Rhode Island not-for-profit hospital group associated with the Brown University Medical School. Columbia's potential entry into the Boston market was a source of concern for all of the hospitals with whom we spoke, and all had assumed that New England Medical Center was the most likely target. With New England Medical Center having merged, it is less likely that Columbia will be able to establish a dominant position among the downtown teaching hospitals in Boston. Columbia will no doubt continue to be a major source of concern to the other Boston hospitals as it decides how or whether it will enter the market.

Most of the consolidations we examine have network creation as one of the goals, if not the central goal. Network creation is valuable to the hospitals both because it ensures access to primary care physicians and their patients and because it gives them more leverage in bargaining with insurers.

The five potential networks in the Boston area is likely too many, however. The networks that are already established employ predatory strategy toward the other networks, and some are in financial trouble. If inpatient demand continues to fall, financial difficulties will increase and further consolidation is likely. This has been the experience in markets where consolidation is more advanced than it is in Boston, such as California and Minneapolis. A common conjecture is that there will eventually emerge roughly three networks in Boston, each with its own group of primary care physicians, specialists, and insurance contracts.

In principle, the provider networks that are being formed could turn into insurance companies, since they will have the inpatient facilities and physician base to do so. It is generally believed, however, that this is unlikely to occur, since hospital administrators do not know the insurance business and may fare poorly in it, and they would risk antagonizing insurers who they otherwise need to negotiate with.

The future of medical care in the area thus appears to be a few large insurers negotiating with a few large provider groups. This is quite a big difference from the older organization of medical care. There may also be a growing role of for-profit hospitals in the Massachusetts market, if Columbia/HCA becomes a major player in the Boston area. Columbia is thought to be advantaged because of its easier access to capital, because of economies of scale in purchasing and negotiating, and because it has

less need to worry about care for the uninsured than do not-for-profit hospitals. If the criterion for survival in the Boston health care market is the ability to survive for-profit entry, then fewer networks than five at the end is probably the right number.

1.7 Are the Mergers Successful?

For many hospitals, particularly the smaller ones, the question of whether the mergers are successful is answered simply by noting whether the hospital has managed to remain open. For the big hospitals, such as those in Pathways or Partners, the question is harder. There are three indicators one can examine to measure the success of consolidations. First, the mergers have implications on the revenue side. The mergers for network creation are intended, partially, to increase revenues from insurance companies through increased bargaining power. The data necessary for this sort of analysis are unavailable, although the anecdotal evidence from our interviews suggests that Partners and Pathways have been somewhat successful in improving their contracts. Examining this in more detail is a key issue for future research.

The second indicator is reductions in costs. If these mergers move hospitals to their efficient scale, then one should expect a fall in average cost following the consolidations. That is perhaps the most direct implication of mergers for economies of scale; medical care should now be provided more efficiently. There is some evidence that the mergers are having a positive effect on costs. Figure 1.8 shows the trend in real costs per adjusted admission in Massachusetts and in the United States as a whole since 1980, and table 1.7 shows summary statistics. Massachusetts has been

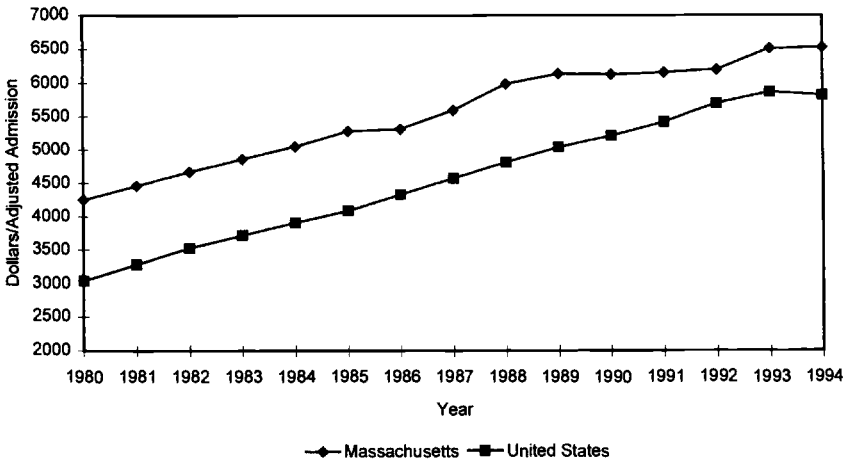


Fig. 1.8 Trend in real costs per adjusted admission

Table 1.7 Annual Growth Rate of Real Costs/Admission (%)

Years	Massachusetts	United States
1970-80	4.0	4.8
1980-85	4.4	5.9
1985-90	3.0	4.9
1990-95	1.6	2.8

Source: American Hospital Association data.

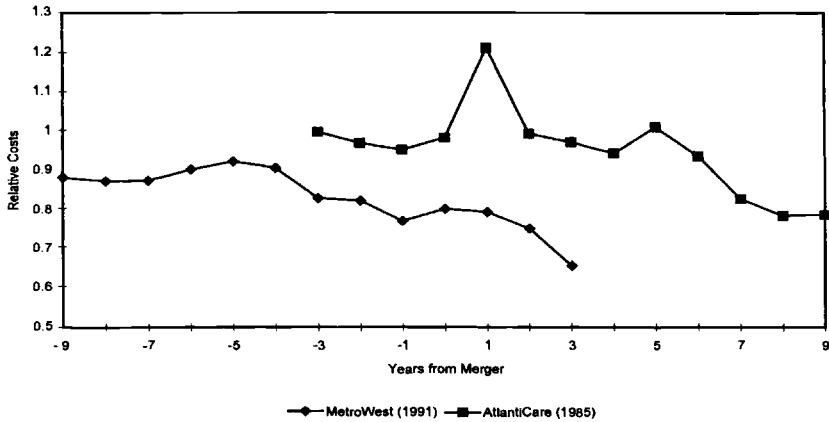


Fig. 1.9 AtlantiCare and MetroWest—costs per adjusted admission relative to the rest of Massachusetts in years around their mergers

affected more by managed care than have most areas, and if managed care is one of the primary driving forces behind mergers for economies of scale, we should expect greater cost reductions there. This is indeed the case. Massachusetts has long had higher medical costs than the nation as a whole, but over the last fifteen years costs have been falling relative to the rest of the country. This is particularly true in the last decade. In the 1980s, cost growth in Massachusetts was below growth in the nation as a whole by 0.8 percentage points. Between 1985 and 1995, the differential has been about 1.5 percentage points.

Of course, what we would like to look at are the cost changes before and after particular mergers we can identify. We are hampered in this effort by the fact that several of the mergers are very recent and thus the potential cost reductions would not have taken place. Two of our mergers are more complete than the others: MetroWest and AtlantiCare. Figure 1.9 shows the hospitals' combined real costs per adjusted admission in the years leading up to and after their respective mergers. Year zero is normalized as the year in which the merger took place: 1985 for AtlantiCare and 1991

for MetroWest. In each case, we scale costs by the average costs in the state as a whole.

There is some evidence that the mergers did lead to cost savings. In the AtlantiCare merger, the time of the merger is likely not the time when cost reduction began, since there were several years of difficulty over the ultimate location of the combined institution. Indeed, the cost reductions appear to come several years later. MetroWest experienced a drop in costs after their merger as well. It will be important to follow the effects of the more recent mergers over the next several years to estimate the degree of cost savings.

The third indicator of merger success is the allocation of customers. One characteristic of the recent consolidations has been the outreach of the big city hospitals into the suburbs, through either the integration of neighborhood clinics or the purchase of neighborhood hospitals. A downtown hospital that purchases a hospital in a suburb should expect to see an increase in its share of patients from that suburb who go downtown for hospital care.

The most natural test of this hypothesis is the Pathways network. Deaconess purchased three suburban hospitals while creating Pathways: Ayer's Nashoba Community Hospital in 1993, Needham's Glover Memorial Hospital in 1994, and Waltham/Weston Hospital in 1995. Table 1.8 shows the Deaconess's share of hospital admissions from the towns of Ayer, Needham, and Waltham/Weston. If network creation is successful, then Deaconess should attract a higher percentage of the hospital admissions in the peripheral towns, particularly those patients that go downtown for care.

The Waltham/Weston acquisition probably occurred too late to have an impact on the admission rates in 1995, and it is therefore not surprising that there is very little movement of patients toward Deaconess relative to its principal downtown competitors. It is perhaps also the case in Needham that the acquisition has not had enough time to adjust admission patterns. If behavior has adjusted as much as it ultimately will, then the story is not very good for network creation; Deaconess's share of patients has actually fallen. The Nashoba acquisition looks to be more successful. Deaconess has gone from a nonentity in the Ayer hospital market to the leading downtown hospital presence, even if it is only 2.6 percent of the market.

Even if the downtown hospital does not succeed in attracting more patients, the alliance can be successful from the local perspective if it strengthens the local hospital. Tables 1.9 and 1.10 show where patients from Ayer and Needham respectively are admitted to the hospital. In both cases, the hospitals that merged with Deaconess have seen their market power improve. In the case of Ayer, Nashoba's gain seems to have come from taking patients from the other large regional hospitals rather than from large, downtown hospitals.

Table 1.8 **Changes in Market Share (1988–95) in Pathways Suburbs**

Market	Deaconess Market Share (%)			Massachusetts General Hospital Market Share (%)			Brigham and Women's Market Share (%)			Beth Israel Market Share (%)		
	1988	1995	Change	1988	1995	Change	1988	1995	Change	1988	1995	Change
Ayer ^a												
Ayer	0.29	2.63	2.34	0.49	0.95	0.46	1.85	2.11	0.26	0.88	0.53	-0.35
Needham ^b												
Needham	2.41	1.99	-0.42	3.00	2.89	-0.11	11.38	10.34	-1.04	5.44	5.75	0.32
Waltham/Weston ^c												
Waltham	0.77	1.33	0.56	2.51	3.02	0.51	5.36	5.12	-0.25	1.74	2.57	0.83
Weston	2.26	2.58	0.32	10.57	10.91	0.34	12.38	13.41	1.03	7.14	7.66	0.52

Source: Massachusetts Rate Setting Commission.

^aNashoba Community Hospital purchased in 1993.

^bGlover Hospital purchased in 1994.

^cWaltham-Weston Hospital purchased in 1994.

Table 1.9 Hospital Admissions from Ayer, 1988, 1995

Hospital	Market Share (%)			Number of Admissions	
	1988	1995	Change	1988	1995
Nashoba Community ^a	41.93	43.31	1.38	431	411
Emerson Hospital	26.85	20.76	-6.09	276	197
Leominster Hospital	9.53	6.11	-3.42	98	58
Burbank Hospital	5.84	4.00	-1.83	60	38
Deaconess Hospital ^a	0.29	2.63	2.34	3	25
Brigham and Women's	1.85	2.11	0.26	19	20
Waltham-Weston ^a	0.00	1.16	1.16	0	11
Massachusetts General Hospital	0.49	0.95	0.46	5	9
N.E. Baptist Hospital ^a	0.49	0.74	0.25	5	7
Beth Israel Hospital	0.88	0.53	-0.35	9	5

Source: Massachusetts Rate Setting Commission.

^aThis hospital is a member of Pathways.

Table 1.10 Hospital Admissions from Needham, 1988, 1995

Hospital	Market Share (%)			Number of Admissions	
	1988	1995	Change	1988	1995
Glover Hospital ^a	38.83	42.27	3.44	1,371	1,594
Newton-Wellesley	18.38	20.90	2.52	649	788
Brigham and Women's	11.38	10.34	-1.04	402	390
Beth Israel Hospital	5.44	5.75	0.32	192	217
Massachusetts General Hospital	3.00	2.89	-0.11	106	109
St. Elizabeth's	2.92	2.23	-0.69	103	84
Deaconess ^a	2.41	1.99	-0.42	58	75
N.E. Baptist Hospital ^a	2.07	1.54	-0.53	73	58

Source: Massachusetts Rate Setting Commission.

^aThis hospital is a member of Pathways.

1.8 Conclusions

Hospital consolidations in Massachusetts have resulted primarily from the pressure imposed on the hospital market by the rise of managed care and changes in technology that reduced the demand for inpatient care. The reduction in demand is manifest in three ways: the need to close, the desire for economies of scale, and the value of health care networks.

Consolidation in the medical care marketplace is likely to fundamentally change the relations between insurers and providers. The old medical system was one where insurers had little power and providers operated at a local level. The new system will have several large insurers bargaining

hard with large networks of providers. A widely expressed view is that by the end of the decade, the Boston area will have been transformed from a market with near fifty hospitals to a market with essentially three to four regional networks of doctors, downtown, and local hospitals.

There are three issues that the consolidation of medical care raises that will ultimately determine the success of this transformation. The first is the effect of these consolidations on the level and growth rate of medical costs. Consolidation seems destined to reduce the level of medical spending. Much of medical costs are the return on past investment (for example, specialist physicians), and the new medical system seems likely to eliminate these rents. The long-run driver of medical costs is new technology, however (Aaron 1991; Newhouse 1992; Cutler and McClellan 1996), and it is less certain what effect consolidation will have on the nature of technological change.

The second issue is the effect of the increased market power of hospitals on the costs ultimately faced by patients. The increased bargaining position of hospitals should shift some rents from their contracts with doctors and insurance companies toward the hospitals. This may raise the premiums individuals pay for insurance, depending on how competitive the insurance industry is. The antitrust implications of mergers are not entirely clear, but essentially all proposed mergers have been approved by state and federal regulators.

The third issue is how the new system will deal with the uninsured and underinsured. A hallmark of the noncompetitive medical care system was the extraordinary amount of "uncompensated care" it provided to the poor. Of course, the care was ultimately paid for in the form of higher prices to governments and the privately insured. As public and private payers become increasingly reluctant to subsidize these activities, the care for those unable to afford insurance may suffer. Medical care consolidation may bring issues of equity and social values to the front even as they push worries over medical costs to the rear.

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Comment Paul M. Healy

Overview of Study

This study examines factors underlying the high frequency of mergers and acquisitions in the hospital industry during the late 1980s and 1990s. Based on their analysis of consolidations in the state of Massachusetts, the authors conclude that mergers were a response to the dramatic decline in demand for hospital beds after 1980. By 1994 demand for beds in the state had fallen to 67 percent of 1980 demand. This trend is expected to continue, with demand forecasted to decline to 50 percent of the 1980 level by 2000.

The authors trace the decline in demand for hospital beds to changes in health insurance and to improved medical technology. In the early 1980s, private managed care insurers as well as public insurers (Medicare and Medicaid) began paying providers on a per-patient basis, rather than on a fee-for-service basis. These fee changes gave health providers greater incentive to economize on health costs and hospital stays. In addition, new medical technologies enabled procedures that would formerly have required a hospital stay to be performed on an outpatient basis.

The authors hypothesize that the sharp decline in hospital demand provided three motivations for mergers: to facilitate hospital closures or bed reductions, to enable small hospitals to survive by consolidating to take advantage of economies of scale, and to help providers create networks to

improve their bargaining power with insurers. The evidence provided in the paper, which is derived from aggregate hospital data and individual firm case studies, is consistent with all three explanations. For example, the field studies suggest that the consolidation of Union and Lynn Hospitals occurred to reduce bed capacity in Lynn, whereas the merger of Massachusetts General and Brigham and Women's Hospitals was aimed at increasing efficiency through economies of scale and creating a powerful network of providers in the Boston area.

The paper has several very positive features. First, by providing evidence on the economic forces underlying hospital mergers, closures, and network creation, it can inform the public policy debate on the merits of hospital mergers, both in Massachusetts and elsewhere in the United States. Second, by using both aggregate data and individual firm case studies, the authors are able to provide stronger evidence on hospital consolidations than would be possible using each of these sources alone. The aggregate data provide evidence on the broad changes taking place in the industry, whereas the field studies provide evidence on management motivations for hospital mergers.

I anticipate that this paper will stimulate additional research on health care provider consolidation, particularly in light of the ongoing public policy debate on the economic implications of provider mergers. I therefore focus my comments on areas where such research could be directed: further examination of reasons for mergers and additional empirical tests.

Further Examination of Reasons for Hospital Mergers

The paper provides a useful overview of the major motives for hospital merger. However, each of the three explanations presented in the paper merits additional consideration.

Mergers to Close Hospitals

Although the authors argue that mergers facilitate hospital closures or capacity declines, they provide relatively little explanation of the forces that make mergers necessary to induce hospitals managers to downsize their facilities. Several explanations are plausible. First, target managers may be reluctant to voluntarily reduce hospital capacity either because of concern about their own job security or because of public pressure to keep community hospitals open. Alternatively, hospital managers may be reluctant to downsize if they believe that their competitors may downsize first, leaving their own firm as the industry survivor. For example, consider two competing hospitals of comparable size and operating efficiency that face a 50 percent decline in demand. Each has an incentive to wait for the other to close, so that it can become the sole provider for the region. The optimal strategy for each provider may therefore be to avoid reducing ca-

capacity, even though demand is shrinking. By agreeing to merge, the two eliminate this destructive private incentive and permit an orderly reduction in capacity to take place within the region.

The above explanations of merging as a form of facilitating closure have different empirical predictions. If mergers occur so that efficiently run hospitals can close or consolidate weaker operations, acquirers are likely to be hospitals that have already reduced their own bed capacity, whereas targets would not. Alternatively, if mergers arise to eliminate private incentives by hospitals in the same region to avoid downsizing, neither partner in the combination will have had to reduce its capacity prior to the merger. In addition, both merger partners would compete in the same geographic region.

Mergers for Economies of Scale

Hospitals may also merge to generate economies of scale. These arise if merging hospitals can reduce the cost of expensive equipment that is currently not fully utilized or can reduce administrative personnel and nursing and medical staff. As the authors note in the paper, “an average hospital had a total budget of \$100 million in 1994, of which approximately 50 percent came from labor expenses. If a hospital could cut 10 percent of its labor force, it would save approximately 5 percent of total spending.”

However, the evidence in table 1.1 suggests that economies in personnel may not be easy to achieve. Indeed, full-time hospital employment per bed is higher for larger hospitals than for smaller. Hospitals with fewer than one hundred beds have an average of 3.66 full-time employees per bed, compared to 5.58 for hospitals with more than three hundred beds. These data suggest that there may actually be diseconomies of scale for physicians, nurses, and other hospital employees, raising questions about the sources of economies of scale in hospital mergers.

Mergers for Network Creation

The third explanation for mergers provided in the paper—the creation of area networks to increase bargaining power with insurers—raises several questions. For example, what are the implications of the combinations for patients? At one level increased provider power is likely to increase the costs of health care for users. However, this need not be the case. For example, if it is difficult for users to evaluate the quality of their health care, powerful providers may counteract insurers’ incentives to increase profits by lowering health care quality. Many communities are increasingly wary of managed care insurers’ incentives to reduce the quality of care and have passed or proposed legislation to regulate insurers.¹ It would be

1. Regulations have been passed in at least twenty states to protect the rights of managed care patients. These regulations cover such issues as assuring managed care patients of continuity of care and access to emergency services, specialists, and experimental procedures, as well as limiting travel and waiting times and providing grievance procedures.

interesting to examine whether these regulations are effective in maintaining health care quality, or whether the creation of powerful provider networks are more effective regulators of insurer incentives.

Management's justification of many of the largest recent hospital mergers on network grounds, rather than consolidation grounds, has an alternative explanation to that provided in the paper. The authors note that by 2000 the demand for hospital beds in Massachusetts is expected to fall by 50 percent relative to its 1980 level, although the number of hospital beds has declined by only 25 percent. Considerable additional capacity reduction is therefore likely to occur. Yet target and acquirer management apparently prefer to focus on creating provider networks rather than on making painful cuts in their own bed capacity. Is management simply avoiding making these difficult downsizing decisions? Certainly, there is casual evidence consistent with this hypothesis. For example, in January 1997, New England Medical Center (NEMC), a struggling nonprofit hospital in Boston, was acquired by Lifespan (a Providence not-for-profit group affiliated with Brown University Medical School). Other bidders for the hospital included Columbia/HCA, the nation's largest for-profit hospital company. Lifespan argued that the acquisition would help it create a strong regional network. The failure of Columbia to acquire NEMC was greeted with relief by all the major area groups, perhaps because Columbia would be more likely to reduce capacity at NEMC and to provide more cost competition in the Boston hospital market. It remains to be seen whether these types of acquisitions provide the intended benefits or whether they have simply delayed inevitable capacity reductions.

Additional Empirical Evidence on Mergers

Because the data used in the study are relatively coarse, there remain opportunities to undertake additional empirical research on hospital consolidations. For example, the evidence on reductions in hospital bed capacity is based on the number of beds available in only two years (1980 and 1994) for both the aggregate tests and the case studies. These data are difficult to interpret since they do not provide evidence on changes in capacity before and after the merger. As a result it is not possible to assess whether mergers actually led to reductions in capacity, as hypothesized, or whether the observed reductions had already taken place prior to the mergers. To distinguish between these competing explanations, additional time-series data must be collected so that beds available at each hospital can be aligned in event time.

Time-series data on hospital capacity will also provide insights into the characteristics of target and acquirer firms, and hence the forces that lead to consolidating acquisitions. For example, are acquisitions to reduce capacity made by acquirers that have successfully downsized their own facilities? Have these acquirers taken over and downsized other providers'

facilities? Are targets in these acquisitions firms that have been slow to reduce capacity? Alternatively, have both partners been unable to make reductions (perhaps because they want to be the survivor in their region)?

Other ways to improve our understanding of the forces underlying acquisitions include examining the premerger characteristics of targets and acquirers. For example, if acquirers merge with providers that have been slow to reduce capacity, there are likely to be differences in operating efficiency for the two firms prior to acquisition. Data on operating costs per patient, operating costs per bed, and occupancy rates can show whether acquirers have lower costs per patient and costs per bed and higher occupancy rates than target hospitals. Also, in areas where there is a mix of not-for-profit and for-profit hospitals, are acquirers more likely to be for-profits, where operating efficiency is viewed as more salient?

It will also be interesting to examine data on postmerger performance for the combined firm. If mergers are justified as a means of developing economies of scale, are they followed by reductions in employees per patient or employees per bed? Are there declines in capital, administrative, and operating costs per bed and/or per patient? Do mergers for the creation of regional networks enable the merged firm to negotiate better deals with insurers, and thereby have higher revenue growth, higher operating margins, and/or higher market share than they would otherwise have had? Do they lead to increased patient occupancy rates? The authors provide some data on these effects, but they are relatively limited. There is scope for additional work on these areas, particularly given questions about the benefits of network mergers noted earlier.

Finally, it would be interesting to examine whether the high frequency of hospital mergers in Massachusetts and the factors underlying these consolidations are also evident in other parts of the country. Are mergers also popular in regions where hospital demand has not declined as rapidly as Massachusetts, perhaps because of offsetting population or demographic changes? Are there nonmerger responses to the decline in hospital demand in other regions?

Summary

In conclusion, this paper provides a fascinating first look at the responses by the hospital industry in Massachusetts to a dramatic decline in demand. The paper is innovative in its use of both aggregate industry and field study data to examine this topic. The observed consolidation of the industry through mergers and acquisitions raises a number of interesting follow-up questions. For example, do the mergers really cause reductions in hospital beds? If so, what forces make mergers the most effective way for providers to reduce capacity? Do firms realize anticipated economies of scale from mergers? How effective are network mergers in improv-

ing providers' bargaining power with insurers? Do these mergers permit providers to avoid costly downsizing? Answers to these questions are particularly relevant given the public debate on the changing health industry landscape.

Comment Frank R. Lichtenberg

Jason Barro and David Cutler have written a very insightful case study of a market undergoing enormous transitions. They document that in 1980, there were 108 acute care hospitals in Massachusetts. By 1994, 21 had closed (or ceased to operate as acute care hospitals) and another 56 had engaged in some kind of affiliation; only 31 "remained the same." As they observe, the rapid structural change in the Massachusetts medical care marketplace is largely attributable to two major types—*organizational* and *technological*—of exogenous innovation in the delivery of health care.

The major organizational innovation was (and continues to be) the replacement of traditional fee-for-service health care by "managed care." Between 1976 and 1995, the fraction of the U.S. population enrolled in health maintenance organizations (HMOs) increased more than sixfold, from 2.8 percent to 17.7 percent (*Health, United States, 1995* [1996], table 136). There was also a shift in the character of managed care: in 1976, staff, group, and network model HMOs accounted for almost all HMO enrollments, whereas by 1995, they accounted for only about one-fourth of enrollments.¹

It is widely believed that people enrolled in HMOs are less likely to be admitted to hospitals than traditionally insured people who are similar in other (observable) respects.² Data from the 1992 National Hospital Ambulatory Medical Care Survey—which provides data on a large random sample of hospital outpatient department visits—are consistent with this view. Overall, the patient is admitted (as an inpatient) to the hospital in about 1.2 percent of hospital outpatient visits. The probability that an HMO patient will be admitted to the hospital is about 0.6 percent lower than the probability that a fee-for-service patient will be admitted, controlling for single year of age, sex, race, ethnicity, (ICD-9 two-digit) diagnosis,

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1. By 1995, "individual practice associations" (IPAs), in which the HMO contracts with an association of physicians from various settings (solo and group practices), and "mixed" (IPA/group) models accounted for the majority of enrollments.

2. The admission rate may be lower, in part, because HMOs may place greater emphasis on preventive health care.

geographic region, “fixed hospital effects,” and a few other variables. In other words, *the HMO patient is about 30 to 50 percent less likely to be admitted to the hospital*, and this difference is highly statistically significant.³ This, of course, implies that the adoption and diffusion of the innovation known as managed care resulted in a sharp decline in the number of hospital admissions, which the authors document.⁴

The time-series evidence—the fact that the number of hospitals was declining when managed care penetration was increasing—is certainly consistent with the hypothesis that the managed care revolution precipitated consolidation in the medical care marketplace. It would be nice to test this hypothesis econometrically using longitudinal data on various health care markets. Although managed care penetration has increased in all regions of the country, it has increased more rapidly in some regions than in others. In the west, for example, the fraction of the population enrolled in HMOs increased from 9.7 percent in 1976 to 29.0 percent in 1995, whereas in the south it increased from 0.4 percent to 11.2 percent (*Health, United States, 1995* [1996], table 136). Was the rate of hospital consolidation in the south during this period significantly lower than what it was in the west?

Technological innovation was the second major cause of the decline in hospital utilization. One aspect of this alluded to by the authors was the substitution of outpatient surgery for inpatient surgery: the fraction of total surgeries performed on an outpatient basis increased from 16.4 percent in 1980 to 54.9 percent in 1993.⁵ Another was the substitution of drugs for surgical treatment. In a recent paper (Lichtenberg 1996), I performed an econometric analysis of the effect of changes in the quantity and type of pharmaceuticals prescribed by physicians in outpatient visits on rates of hospitalization, surgical procedure, mortality, and related variables. I examined the statistical relationship across diseases between changes in outpatient pharmaceutical utilization and changes in inpatient

3. In the 1991 National Ambulatory Medical Care Survey—a random sample of outpatient visits to doctor offices—the HMO hospitalization rate is also lower than the fee-for-service hospitalization rate (controlling for similar covariates), but the difference is statistically insignificant. Patients visiting hospital outpatient departments tend to have lower incomes than those visiting doctors’ offices, so this may indicate that managed care may limit hospitalization of low income individuals to a greater extent.

4. The difference between HMO and fee-for-service hospital admission rates may reflect a variety of factors, and may either overstate or understate the true “effect” of HMOs on hospitalization. One reason for overstatement is that exogenously healthier individuals may self-select for HMO coverage when they have a choice. On the other hand, as Laurence Baker and Martin Brown (1997) have hypothesized, there may be “spillovers” (e.g., “demonstration” or “threat” effects) from HMO practices to fee-for-service practices; this would cause the difference in probabilities to understate the effect of HMOs.

5. *Health, United States, 1995* (1996), table 90. The outpatient share of total surgeries increased most rapidly in small hospitals: 62.5 percent of surgeries performed in 1993 in hospitals with fewer than one hundred beds were outpatient surgeries, compared to 47.0 percent in hospitals with five hundred beds or more.

care utilization and mortality during the period 1980–92. I found that the number of hospital stays, bed days, and surgical procedures declined most rapidly for those diagnoses with the greatest increase in the total number of drugs prescribed and the greatest change in the distribution of drugs, by molecule. The estimates implied that an increase of one hundred prescriptions is associated with 1.48 fewer hospital admissions, 16.3 fewer hospital days, and 3.36 fewer inpatient surgical procedures. Greater quantity and novelty of pharmaceuticals had a negative impact on average length of stay in hospitals, as well as on the number of hospital stays. The average number of inpatient procedures performed per stay increased more slowly for diagnoses with higher growth in drug quantity and novelty.

Barro and Cutler attempt to assess the *consequences* as well as the *causes* of hospital consolidation, but their ability to do so is limited by the recency of most of the mergers and alliances and by incomplete data on hospital inputs, outputs, and prices. In principle, hospital mergers may be profitable because they enable the hospitals to reduce costs (increase productivity), raise prices, or both. As the authors note, cost savings are most likely to be realized in administrative departments (e.g., information services, human resources, and building and construction). My research (1992) on mergers and acquisitions in the manufacturing sector of the economy is consistent with this view. I found that mergers had a much greater impact on the employment of administrators than they did on production workers, and that reductions in administrative costs accounted for almost half of the productivity gains associated with mergers.

Unfortunately, measuring the productivity of hospitals is much more difficult than measuring the productivity of manufacturing plants (and even that is subject to pitfalls!). Costs per admission and similar resource-intensity measures may be misleading because of substantial heterogeneity in case mix and severity of illness. The authors note that “most research suggests that the pool of patients being admitted to hospitals is sicker now than it used to be,” so that the increase in deflated costs per admission overstates the true rate of cost increase. The data on AtlantiCare’s and MetroWest’s relative costs per adjusted admission presented in figure 1.9 suggest that these costs tend to decline following the merger, but there is also evidence of a downward trend premerger, which may simply continue (not accelerate) after consolidation.

The authors argue that an important reason for a hospital to join a network of health care providers is to increase its bargaining power vis-à-vis large-scale purchasers of health services (managed care organizations and insurance companies). Consolidation may enable hospitals to charge higher prices and enhance their “market power” in the face of the increased monopsony power that large-scale purchasers have acquired. Presumably due to lack of data, Barro and Cutler do not examine the behavior of prices of hospital services in relation to supplier consolidation;

hopefully they or others will do so in future research. According to Martin Gaynor (1997), the Federal Trade Commission has challenged several proposed hospital mergers on antitrust grounds, but it has not won any of these cases; the courts ruled that these mergers did not pose a threat to consumer welfare.

Standard models of perfectly or monopolistically competitive industries imply that a contraction in demand will result in industry restructuring and a reduction in the equilibrium number of “firms.” Barro and Cutler have done an excellent job of vividly describing both the main features and the nuances of that adjustment process in an actual, and very interesting, market.

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