Division of Health Care Finance and Policy

Comparing Acute Care Hospital Emergency Department Costs

March 1997

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Commonwealth of Massachusetts

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Preface

On July 1, 1996, the Massachusetts Rate Setting Commission and the Department of Medical Security were consolidated to create the Division of Health Care Finance and Policy.

Overview

The Division is responsible for the information, pricing, and regulatory functions formerly handled by the Rate Setting Commission. In addition, the Division administers the Uncompensated Care Pool, a fund that reimburses Massachusetts acute care hospitals and community health centers for services provided to uninsured and underinsured individuals.

Satisfying the Need for Health Care Information

The effectiveness of the health care system depends in part upon the availability of applicable information. In order for this system to function properly, purchasers must have accurate and useful information about quality, pricing, supply and available alternatives. Providers need information on the productivity and efficiency of their business operations to develop strategies to improve the effectiveness of the services they deliver.

State policy makers need to be advised of the present health care environment, as they consider where policy investigation or action may be appropriate.

Mission

The Division's mission is to contribute to the development of policies that improve the delivery and financing of health care in Massachusetts by:

- collecting and analyzing data from throughout the health care delivery system;
- disseminating accurate information and analysis on a timely basis;
- facilitating the use of information among health care purchasers, providers, consumers and policy makers; and
- monitoring free care in the Commonwealth through thoughtful administration of the Uncompensated Care Pool.

As part of its health care information program, the Division publishes reports to meet this need for information. These reports focus on various health policy and market issues.

Organizational Structure

The Division of Health Care Finance and Policy is an administrative agency within the Executive Office of Health and Human Services. The Commissioner is appointed by the Governor.

The organizational structure is comprised of several distinct groups:

- Health Systems Measurement and Improvement Group
- Health Data Policy Group
- Pricing Policy and Financial Analysis Group
- Audit, Compliance and Evaluation Group

Each group is responsible for a different aspect of the agency mission.

Health Systems Measurement and Improvement Group

Health Systems Measurement and Improvement Group works to accelerate efforts to improve the delivery of primary care services in Massachusetts. Toward this end, the Group provides research and demonstration resources to other state agencies, facilitates and supports the development of statewide measurement systems for quality and efficiency in collaboration with hospitals and health plans, and strives to meet the information needs of the administration and legislature regarding the changing health care system. In addition, Health Systems Measurement and Improvement Group acts as a central source of health care information for the agency.

Health Data Policy Group

The Health Data Policy Group is charged with having a vision for the management, development and potential use of Division of Health Care Finance and Policy data by researching and evaluating health data management and policy issues.

The group also is responsible for identifying and developing confidentiality and privacy protocols, data base quality improvement, customer driven data products and consistent data policies. The goal of this group is to anticipate future health care information needs and recommend product development that is accurate, useful, realistic and timely.

Pricing Policy and Financial Analysis Group

The Pricing Policy and Financial Analysis Group develops health care pricing policies, methods and rates which support the procurement of high quality services for public beneficiaries in the most cost-effective manner possible. This group also provides information, analysis and recommendations to policy makers to support their health care financing decisions, and performs specialized analyses of innovative health care financing and purchasing methods.

Audit, Compliance and Evaluation Group

The Audit Compliance and Evaluation (ACE) Group examines financial data reported to the Division of Health Care Finance and Policy. The ACE Group performs audit, review, screening and quality control functions that provide the building blocks for the Division's work in developing pricing policies and measurement tools to improve the health care system in Massachusetts.

The Division of Health Care Finance and Policy's support units include Administration, the Information Technology Group, the Office of the General Counsel and the Office of Communications.

Administration

The Office of the Executive Secretary oversees the agency's budget, regulatory process and personnel.

Information Technology Group

The Information Technology Group is responsible for managing the Division's computer network and data bases.

Office of the General Counsel

The Office of the General Counsel litigates administrative appeals filed by providers, analyzes proposed legislation relative to the health care delivery system and provides legal advice to the Commissioner and staff concerning the development and application of regulations, policy positions and pricing information.

Office of Communications

The Office of Communications produces the Division's publications and serves as the point of contact for inquiries from outside parties.

This structure reflects the focus of the agency mission and supports the Division's efforts to provide useful health care information to purchasers, providers, and policy makers throughout the Commonwealth of Massachusetts.

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Executive Summary

The purpose of this report is to present statewide information for the first time comparing hospital costs of an outpatient department. Given the kind of outpatient data the Division of Health Care Finance and Policy currently has available, and based on industry participant level of interest, emergency department (ED) data seemed to be a good place to start. The Division hopes to promote efficient delivery of health care services by providing comparative data. While the data do not offer a complete account of the efficiency of individual providers, they do provide a baseline of standardized hospital expenses from which one can benchmark the costs of a hospital relative to its peers across the state.

Hospital emergency departments face many pressures on their activities and costs. Federal legislation requires any hospital that receives Medicare funding to screen, and where appropriate, treat and stabilize all patients presenting to EDs seeking care, regardless of insurance status. With the continuing strong role of managed care, hospitals may face evaluating, treating and stabilizing a patient who, due to contractual arrangements, they are told to direct to another provider. In addition, most insurers now require pre-approval on the part of the patient before presenting at the ED. The hospital undertakes a significant amount of

Key Points

- This is the first time that providers and purchasers have a publicly available tool using a standardized methodology for making statewide comparisons on a specific outpatient department's costs.
- In 1995 Massachusetts acute care hospitals experienced more than 2.6 million emergency department visits accounting for over $1 billion in gross charges and $712 million in costs.
- There is significant variation in emergency department cost per visit, with a range from $91 to $888 per visit. Purchasers and providers of hospital care should explore the variation in costs and use these data as a starting point to benchmark performance.
- There are many reasons for the variation in costs, some more controllable than others. Looking at hospitals with similar characteristics should help participants identify where opportunities for improvement exist.

financial risk in complying with federal mandates where payment for services rendered may be refused or, in the case of the uninsured, unavailable. Many patients present to the ED for non-urgent or semi-urgent care. These cases must be evaluated and treated, despite their non-emergent nature. The impact on costs is not clear. One recent study[1] suggests that the cost to treat non-emergent cases in the ED is not significantly greater than the cost incurred in other health care settings, such as a physician's office. In addition, the ED offers access to patients during hours when other providers are not open.

Emergency departments must maintain the technological and staffing capacity to treat life-threatening conditions and injuries, regardless of the actual number of visits on a 24 hour basis. Therefore, in many cases, a low volume ED may have a higher cost per visit. Trauma centers have special services and providers available at all times. There are large personnel and facility resources required for patient care, education, and research which require significant economic resources. Hospital EDs that are designated trauma centers face higher costs than those that are not trauma centers.

During the 12 month period from October 1994 through September 1995, Massachusetts acute care hospitals experienced more than 2.6 million visits to their emergency departments. On average, 12% of these visits resulted in an inpatient admission. From an inpatient perspective, of total patients discharged from an acute care hospital in Fiscal Year 1995, 42% were admitted through the hospital's emergency department. Emergency departments in Massachusetts experienced more than $1 billion in charges and $712 million in costs over the 12 month period.

End Note for Executive Summary

1. Williams, Robert M. The Costs of Visits to Emergency Departments. *The New England Journal of Medicine*, March 7 1996.

Full Emergency Department Costs

Full emergency department (ED) costs include all capital, operating and ancillary expenses associated with the delivery of care in the emergency department. In Fiscal Year 1995 full ED costs per visit ranged from $91 per visit to $888 per visit, with a median of $232 (see Figure 1 below). Although many elements play a role in the variation of costs, some factors are beyond the short term control of hospital administrators and clinicians. The patient population, hospital location, and emergency department volume play a role in the costs associated with delivery of ED services. Smaller hospitals with lower ED volume may incur a higher ED cost per visit because of a smaller patient base across which they can spread their fixed costs, such as staffing and equipment.

In addition, costs vary because hospital emergency departments have different staffing arrangements. These arrangements may

Distribution of Emergency Department Full Costs Fiscal Year 1995

Figure 1 Full emergency department costs per visit for 81 acute care hospitals ranged from $91 per visit to $888 per visit, with a median of $232 in Fiscal Year 1995.

vary by number and type of personnel, as well as the type of contractual arrangements with professional staff. Some providers may use more physician extenders (Physician Assistants or Nurse Practitioners), some may have salaried physicians while others contract, and some providers may provide professional billing as well.

Another example of why there is such variation in emergency department costs is that some providers have urgent care centers or observation beds as part of their ED costs. Others may offer these services as distinct and separate units. Data relating to these differences is difficult to obtain. In many cases, some of the costs of treating a patient in the emergency department, who is subsequently admitted to the hospital, may end up being reported as inpatient costs. This occurs predominately in ancillary testing, such as laboratory and radiology work. This flexibility in reporting practices is yet another reason for some of the variation seen in costs.

Comparable Emergency Department Costs

Because certain costs are frequently cited as beyond the short term control of hospital management or are incurred to provide services which are not equivalent across institutions, the Division of Health Care Finance and Policy has attempted to standardize cost data to improve comparability across hospitals.

To calculate comparable costs per visit, the Division adjusted hospital emergency department (ED) expenses for capital, medical education programs, hospital-based physicians, and geographic wage variation. In earlier reports the Division had concentrated on calculating inpatient costs per visit.

For inpatient costs we were able to narrow the range between full and comparable costs by a significantly greater margin because we were able to adjust each provider's patient caseload for relative resource use through the case mix adjustment. The data necessary to calculate a case mix adjustment

Distribution of Emergency Department Full and Comparable Costs - Fiscal Year 1995

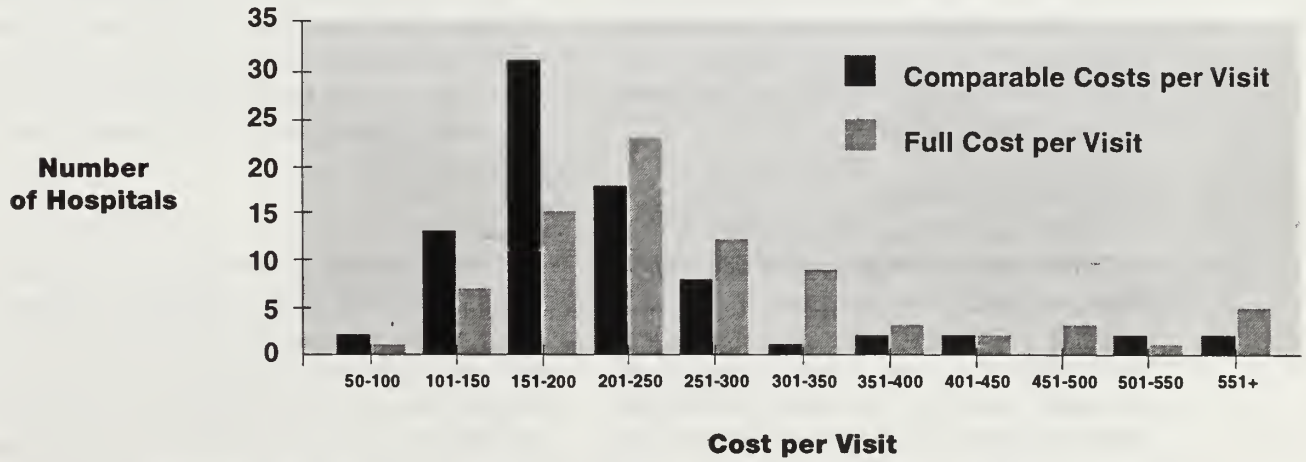

Figure 2 Compared to full costs, comparable costs per visit show a narrower and more concentrated range. Comparable ED costs per visit ranged from $55 to $634 per visit with a median of $178 per visit.

is not currently available for emergency departments.

In Fiscal Year 1995, comparable costs ranged from $55 to $634 per visit, with a median of $178 per visit. Compared to the full costs, the range is slightly narrowed and definitely more concentrated at a lower cost (see Figure 2 on page 5).

Non-Comparable Elements

The amounts excluded from, or adjusted in the comparable cost calculation account for some of the variation in full costs. The following is a brief description of the adjustments or exclusions that were made to the ED full costs.

Capital

For many hospitals, annual capital expenses are significant. In the short term, however, since capital purchases have usable lives of longer than one year, their costs may reflect the position of a hospital in its capital investment cycle, its credit rating, or other factors rather than the efficiency of operations. Although newer facilities and equipment create higher capital costs, they may also offer a trade-off in lower maintenance costs. The calculation of comparable costs therefore excludes all capital and major movable equipment (MME) and fixed capital (land and buildings).

Medical Education

Many emergency departments in Massachusetts train medical professionals in addition to caring for patients. As a result, hospitals experience expenses which other providers do not share. Direct teaching costs are explicit costs incurred to administer the training programs themselves. While higher costs remain at teaching hospitals even after accounting for direct medical education, some of these expenses may also relate to the teaching function or the tertiary nature of the hospitals. Costs may vary due to the size of the teaching program and the training focus. Higher teaching costs may reflect the dual mission of both training health care workers and treating patients.

Hospital-Based Physicians

The financial relationships between doctors and hospitals vary across the industry. Some hospitals directly employ many physicians for patient treatment and for department supervision. Others only employ physicians as supervisors, meeting more of their patient care needs through non-salaried staff physicians. Hospitals may provide billing services for physicians that cover the emergency department. The different arrangements hospitals have with physicians, and the variation in compensation arrangements may complicate the comparison of hospital costs. Comparable ED costs remove all hospital-based physician costs directly associated with patient care.

Geographic Wage Variation

Because labor represents a large portion of total hospital costs, regional differences in wage rates may strongly influence operating costs. Failure to adjust for these differences would complicate cost comparisons. The Division used the Nearest Neighbor Index (NNI) to calculate the labor adjustment. The NNI represents a provider's relative salary and wage level compared to its nearest hospital neighbors.[1]

Case Mix

The composition of the patient population of each hospital's emergency department exerts a strong influence on costs. On the inpatient side, the relative level of resources needed to treat patients with different illnesses can be estimated by adjusting for case mix. Because individual ED claims data are not available, a case mix adjustment for intensity was not possible. We did calculate a case mix adjustment for those patients

admitted through the emergency department to the hospital. This information is discussed further on in the report. Peer groupings were created to approximate possible differences in emergency department patient intensity. Peer groups and their relationship to costs are discussed in the following section, "Peer Group Comparisons".

End Note for Comparable Emergency Department Costs

1. Wage area indices used to calculate the labor adjustment are the Nearest Neighbor Indices (NNI) as developed in accordance with the calculation of the most recent Massachusetts DRG cost weights for AP and APR-DRGs version 12. The NNI is the same as that proposed by ProPac except that areas were updated for incorrect addresses, closed institutions or hospitals that have converted status. The index was constructed using HCFA's Fiscal Year 1992 audited wage survey data.

Peer Group Comparisons

The Division of Health Care Finance and Policy hopes the information in this report will help organizations to analyze groups of facilities which are relevant to their networks or competitive environments. To assist users with this benchmarking function, the Division has compared costs among Massachusetts hospitals' emergency departments by developing peer groups based on teaching status, trauma center designation, emergency department volume, presence of salaried physicians, emergency medical services (EMS) trauma regions, proxy for free care, percent of patients admitted to the hospital, and hospital market area average household income. Appendix A on page 25 lists hospital specific data in alphabetical order as well as any peer group in which a hospital falls.

Teaching Status

Nineteen Massachusetts acute hospitals with emergency departments participate in the education of new clinicians through a variety of medical residency and other graduate medical, nursing and technician training programs. These programs lead hospitals to incur costs not shared by other hospitals. In Fiscal Year 1995, the median full cost per visit for teaching hospitals was $325 with a range of $147 to $888. The median comparable cost per visit was $217 with a range of $122 to $634.[1] The median full and comparable costs for the teaching hospitals were 45% and 22% higher than the nonteaching hospitals (see Figure 3 on page 10).

Trauma Center Designation

The Division used the Department of Public Health's Emergency Medical Services (EMS) trauma center designation to determine trauma status for Massachusetts hospitals. Ten hospitals received the EMS designation. Trauma centers typically deal with more intense cases than non-trauma centers, and must meet certain staffing and equipment requirements. Hospitals incur additional costs to provide these services. The median full cost per visit was $396 with a range of $261 to $637. The median comparable cost per visit was $252 with a range of $152 to $591. The median full and comparable costs for trauma center hospitals were 78% and 42% higher than the non-trauma center hospitals (see Figure 4 on page 10). Figure 5 on page 11 shows significantly higher costs when examining full and comparable costs at all acute hospitals compared to teaching and trauma center hospitals.

Also, costs at the trauma hospitals in particular are rising. Trauma hospitals' full costs have increased nearly 32% from Fiscal Year 1993 to Fiscal Year 1995 (see Figure 6 on page 11). Possible reasons for this are that trauma centers may be subject to contracting arrangements that only allow the most traumatic cases, and therefore the more expensive cases, to be treated at the centers, or the use of increasingly sophisticated and expensive technology.

Emergency Department Full and Comparable Costs Teaching versus Non-teaching Hospitals

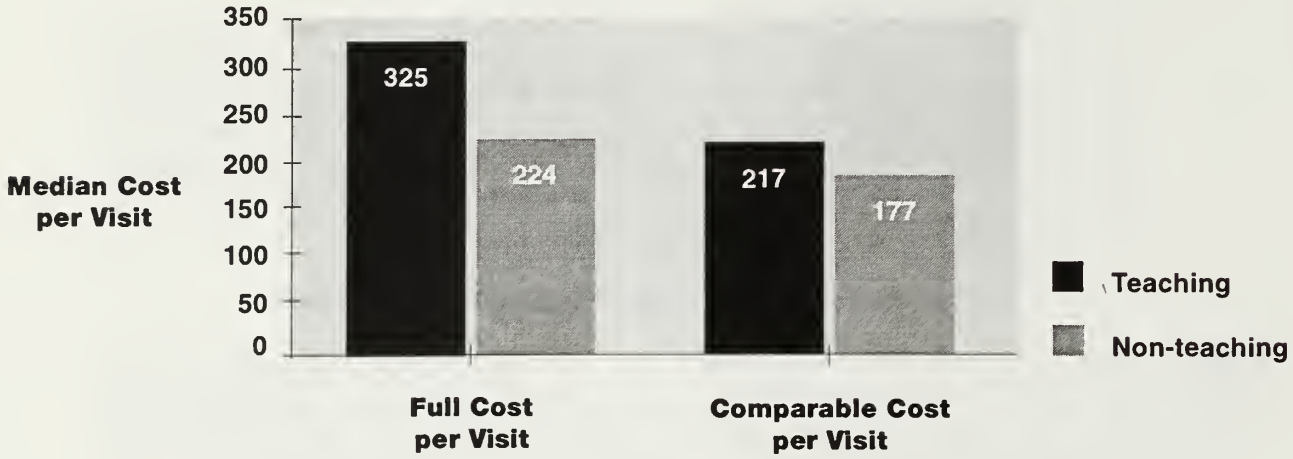

Figure 3 The median full and comparable costs per visit for 19 teaching hospitals were 45% and 22% higher than the non-teaching hospitals.

Emergency Department Full and Comparable Costs Trauma versus Non-trauma Hospitals

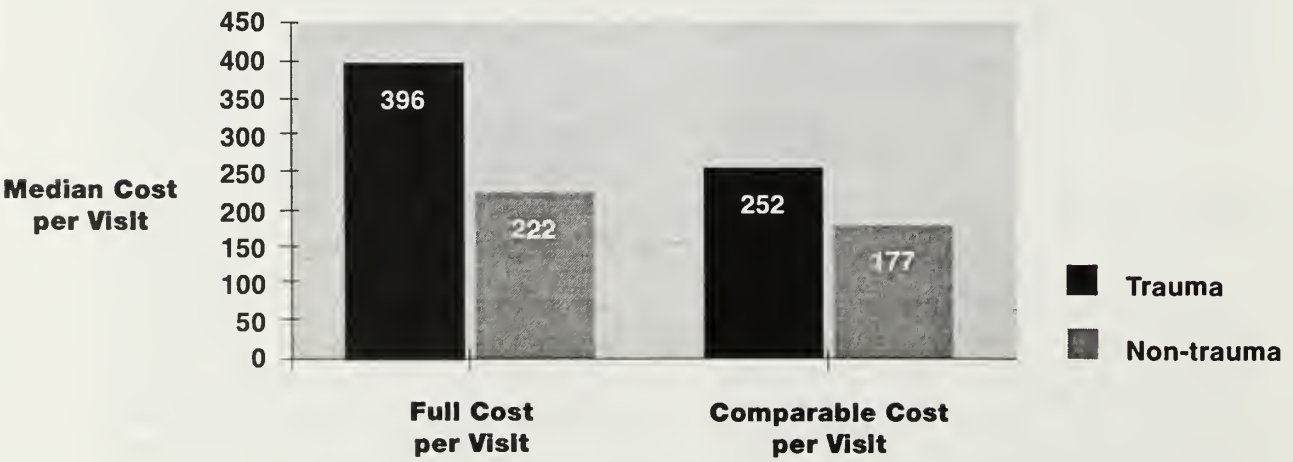

Figure 4 The median full and comparable costs per visit for 10 hospitals with designated trauma centers were 78% and 42% higher than hospitals without designated trauma centers.

Comparison of Medians: All Hospitals, Teaching and Trauma - Fiscal Year 1995

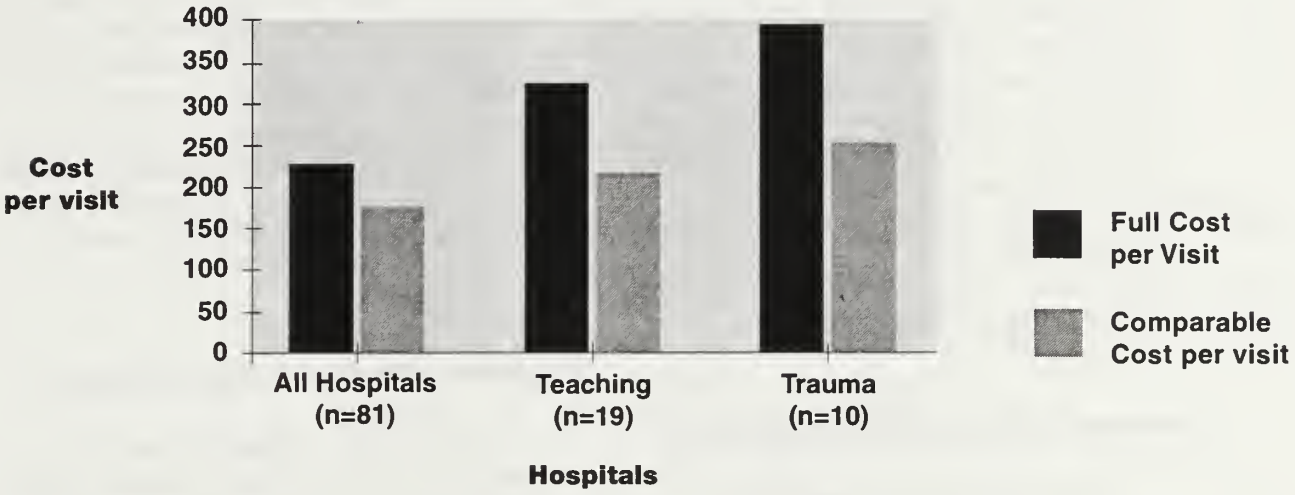

Figure 5 The median full and comparable costs per visit for teaching and trauma hospitals at $325, $217, $396 and $252 are significantly higher than for all hospitals ($232 and $178).

The Trend in Emergency Department Costs Fiscal Years 1993-1995

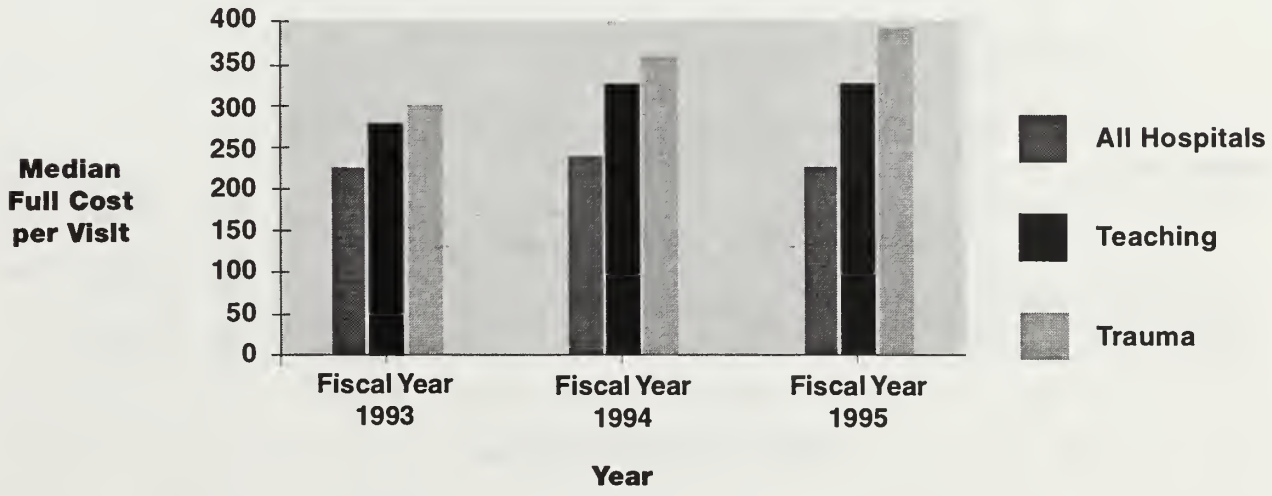

Figure 6 While all hospitals' median full cost per visit has remained fairly stable, teaching and in particular trauma hospitals have experienced significant increases in costs over three years.

Emergency Department Volume

Independent of the size of the emergency department and the number of patients seen, EDs must maintain the technological and staffing capacity to treat life-threatening conditions and injuries. Smaller hospitals with a lower ED volume may incur a higher ED cost per visit because of a smaller patient base across which they can spread their necessary fixed costs. Hospitals with the lowest number of ED visits experienced high median comparable and direct costs per visit than EDs with more visits (see Figure 7 below).

Salaried vs. Non-salaried Physicians

Full and direct costs are higher for providers reporting salaried physicians. The median full and direct costs were $246 compared to $218 and $100 to $70 (see Figure 8 on page 13). The comparable costs were just about the same as one of the adjustments made is to remove physician expenses. It is important to note that this still does not take into account the variety of contractual arrangements providers may undertake with physicians. It is possible for a provider to have higher costs due to contractual arrangements with physicians, particularly where the hospital has contracted to provide all billing.

Emergency Medical Services Regions

There are five emergency medical services (EMS) regions in Massachusetts. Region I in Western Massachusetts is comprised of 13 hospitals, Region II in Central Massachu-

Lower Volume Emergency Departments Often Experience Higher Costs

Figure 7 Hospitals with the lowest number of emergency department visits experience the highest median comparable and direct costs per visit.

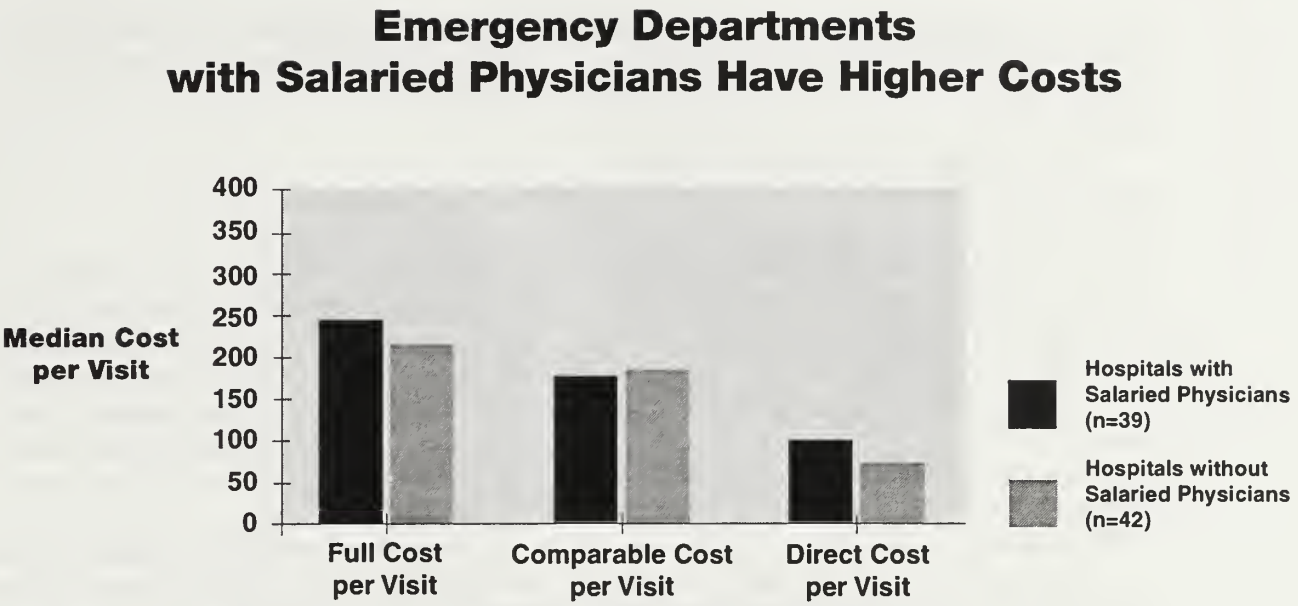

Figure 8 Full and direct costs per visit are higher for hospitals with salaried physicians.

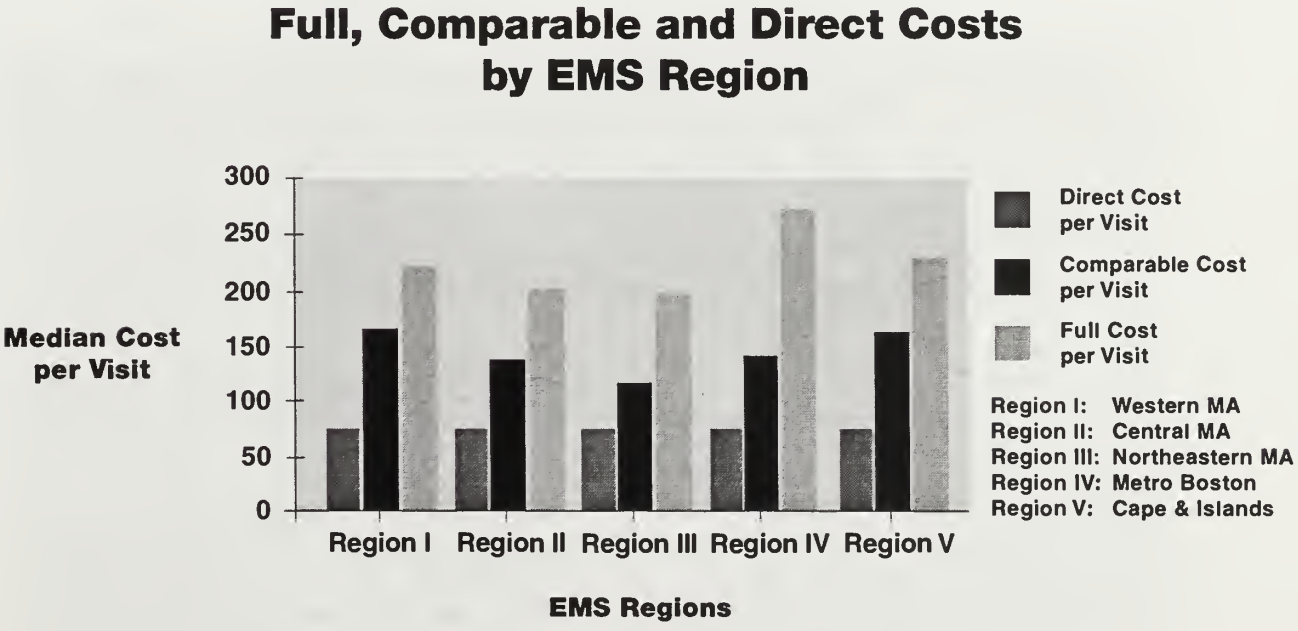

Figure 9 Direct costs per visit are fairly stable across the EMS regions, however, full and comparable costs per visit show more variation.

setts is 12 hospitals, Region III in Northeast Massachusetts has 15 hospitals, Region IV in Metropolitan Boston has 28 providers and Region V (Cape Cod & the Islands) has 13.

Median full costs ranged from $204 (below the statewide median of $232) to $279 with Region IV at the high end of the scale. Region IV had by far the largest number of teaching and trauma hospitals, which would account for its relatively higher full cost.

Median comparable costs ranged from $164 in Region III (below the statewide median of $178) to $206 in Region V. Region V includes a number of hospitals where the comparable cost is higher due to the wage area adjustment.

The median direct costs per visit were closely distributed around the statewide mean of $90 with a low of $86 in Region III to a high of $97 in Region V. There is little variation in direct costs per visit, however, as overhead and ancillaries are added to get full costs, variation increases (see Figure 9 on page 13).

Proxy for Free Care

Hospitals providing more services to uninsured patients often experience higher costs. There may be many reasons for this including poorer overall health status of the presenting patient, communication problems, lack of discharge options for the homeless, increased security needs, inefficiency, and others.

Using emergency care charges whose associated costs are partly reimbursed by the state's Uncompensated Care Pool, hospitals providing the highest levels of privately unreimbursed emergency care experience high costs per visit. The median full cost per

Key Definitions

- ***Full Costs*** are all costs associated with delivering services to a patient. Included are labor costs, physician compensation, purchased services, supplies, major moveable equipment and fixed capital depreciation. Full costs are comprised of routine, overhead and ancillary expenses.
- ***Comparable Costs*** start with full costs and exclude capital, direct teaching program costs and physicians. In addition, labor costs are adjusted for variation in wages. Comparable costs help remove some of the variation seen in full costs.
- ***Direct Costs*** are a subset of full costs. They are comprised of routine costs assigned directly to the specific cost center and so include labor, physician compensation, purchased services, supplies and major moveable equipment. Overhead, such as administration or maintenance expense, or ancillary, such as laboratory or radiology expenses, are not included. ED directors may have more influence over direct costs, which exclude statistically allocated overhead and ancillary costs.

Full, Comparable and Direct Costs by Amount of Emergency Bad Debt

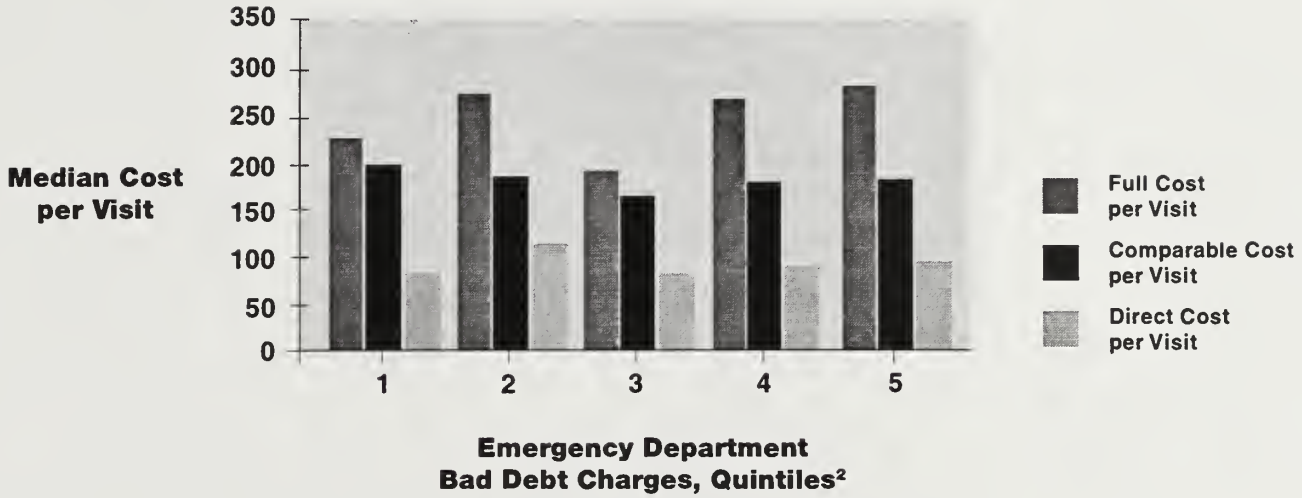

Figure 10 There is variation in costs at hospitals when grouped by the amount of emergency bad debt charges the hospitals experienced. The median full cost per visit for the hospitals with the highest level of ED bad debt charges was $279 compared to the statewide median of $232.

visit for hospitals reporting the highest level of emergency bad debt charges is $279. This is much higher than the statewide median of $232. The median comparable cost is slightly higher at $181 compared to the statewide median of $178, and the median direct costs are also higher at $95 versus the $90 statewide median (see Figure 10 above).

Percent of Patients Admitted to the Hospital

Another peer group that serves as a rough proxy for a case mix adjustment grouped the data by the percent of patients that end up being admitted to the hospital from the emergency department. In Fiscal Year 1995 the median percent of patients admitted to the hospital from the emergency department was 10.78%. Figure 11 on page 16 clearly shows that hospitals that experience a higher percentage of admissions from the emergency department also experience higher costs. This is what would be expected as patients who are ill enough to be admitted would need a higher level of resources for evaluation and treatment in the emergency department.

Average Income Levels

Hospitals serving a higher share of low income patients may have a greater economic burden due to a variety of issues including health status or social issues. These hospital EDs may have difficulty locating suitable discharge settings for patients and may face more uninsured patients with inadequate primary care. In order to examine the costs for these hospital emergency depart-

As Emergency Departments Admit More Patients to the Hospital, Emergency Department Costs Increase

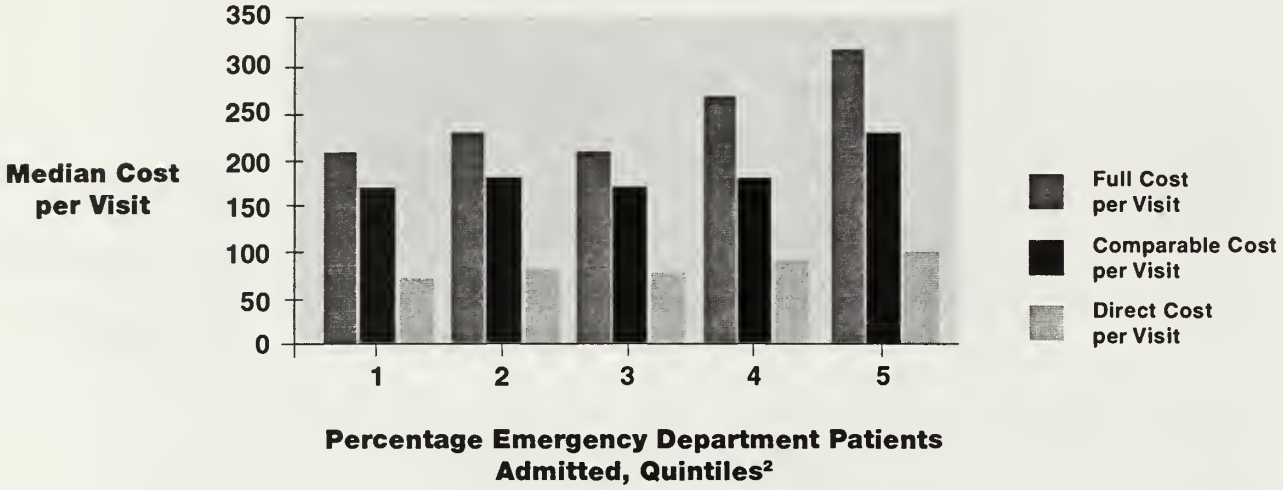

Figure 11 Hospitals that experience a higher percentage of admissions from the emergency department, also experience higher costs per visit.

Emergency Department Costs Are Lower for Providers Serving Market Areas with Higher Incomes

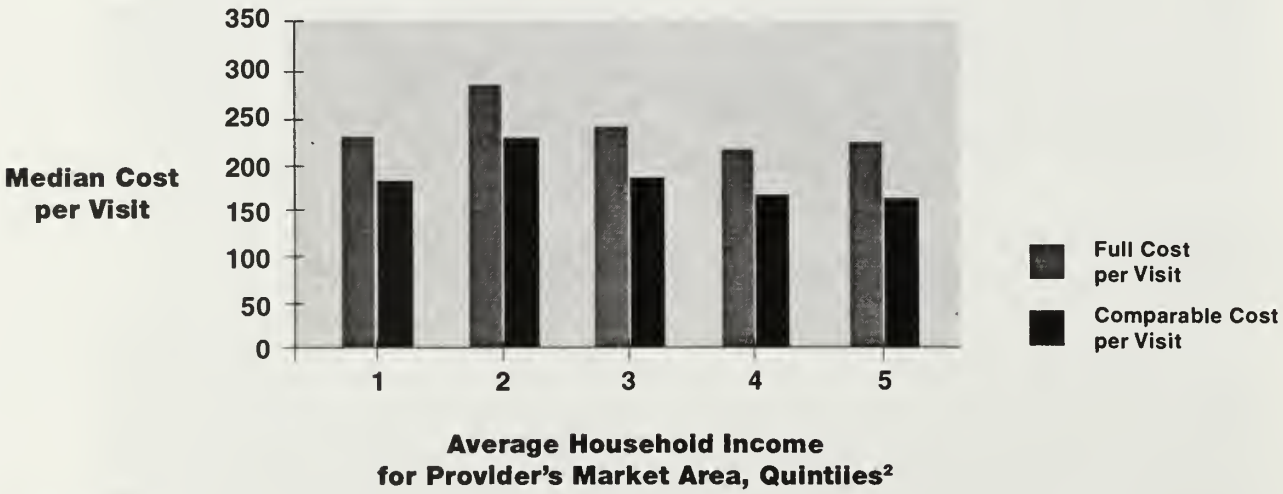

Figure 12 Hospitals serving market areas with lower average household incomes experienced higher full and comparable costs per visit than the statewide averages. Hospitals serving market areas with higher average household incomes experienced lower full and comparable costs per visit than the statewide averages.

ments, census data was used to determine the average household income for each hospital's market area.

The range in average household income for each hospital's market area was from $28,970 to $55,485. The full and comparable costs per visit are somewhat higher in the lower income ranges and the lowest costs are found at providers serving a population that lives in areas with above average income (see Figure 12 on page 16). Possible explanations for the low costs areas are lower violent crime rates, or populations with a higher health status.

End Notes for Peer Group Comparisons

1. The highest cost acute care hospital is a teaching hospital that serves a specific patient type incurring high resource needs and costs. This provider is not a designated trauma center. Therefore, the high appears higher under the teaching hospitals peer group than the trauma peer group.

2. Please see Appendix A on page 25 for quintile amounts and to see the quintile into which a particular hospital falls.

A Look at Patients Admitted to the Hospital

Although emergency department (ED) claims data are not available, hospital inpatient data can be used as a proxy to examine diagnoses and intensity issues. On average, 12% of patients presenting to the emergency department are admitted to an inpatient bed. A closer look at these discharges reveals that admitted ED patients experience diagnoses commonly associated with ED use (see Figure 13 below). For example, DRG 127 Heart Failure & Shock is the most common reason an ED patient is admitted to the hospital. Seventy-five percent of all hospital discharges for DRG 127 are admitted through the emergency department. Heart conditions, respiratory problems, and psychoses round out the most common ED conditions admitted. In Figure 13 below, the top 10 DRG list of Fiscal Year 1995 ED discharges admitted to the inpatient comprise 32% of total ED discharges admitted as inpatients.

Top Ten DRGs for Patients Admitted through the ED

DRG	Description	All Patients Total Discharges	ED Patient Discharges	ED Discharges as a % of Total Discharges by DRG	ED DRG as a % of Total ED Discharges (n=326,546)
127	Heart Failure and Shock	22,358	16,853	75%	5%
89	Simple Pneumonia and Pleurisy	20,709	14,625	71%	4%
121	Circulatory Disorders with AMI	15,530	12,307	79%	4%
430	Psychoses	24,442	11,687	48%	4%
88	Chronic Obtructive Pulmonary Disease	13,541	9,796	72%	3%
143	Chest Pain	10,277	8,453	82%	3%
188	Other Digestive System Diagnoses	13,135	8,439	64%	3%
96	Bronchitis and Asthma	12,237	7,918	65%	2%
296	Nutritional and misc. Metabolic DX	12,045	7,589	63%	2%
138	Cardiac Arrhythmia & Conduction Disorders	11,013	7,421	67%	2%

Figure 13

Case Mix Indices (CMIs) Are Higher for Patients Admitted through the Emergency Department

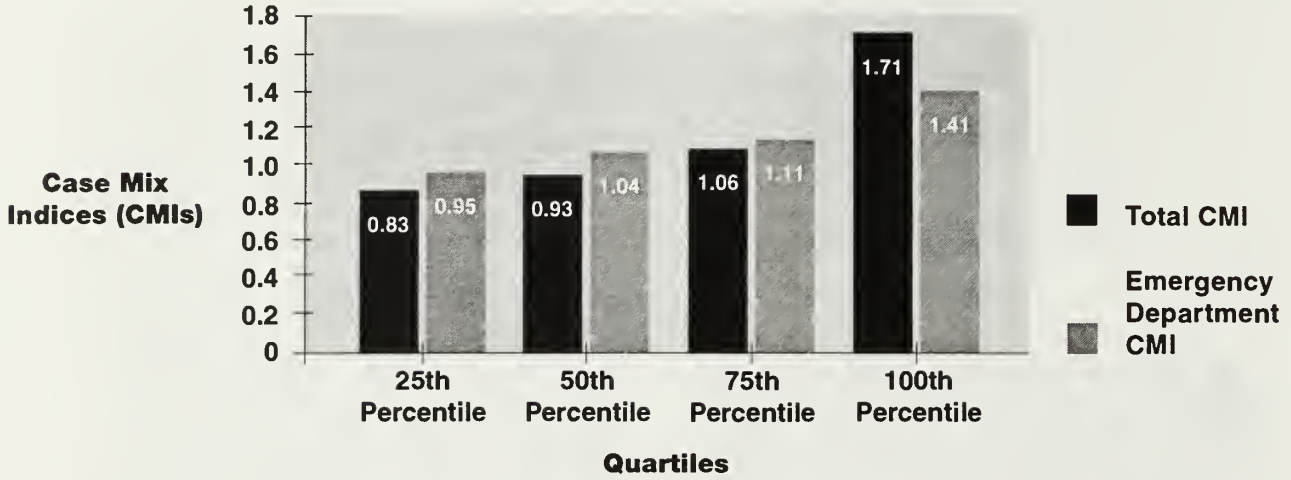

Figure 14 On average, patients who are admitted to a hospital through its emergency department require more intensive resources than other patients.

CMIs for Patients Admitted through the ED Are Higher for Teaching Hospitals

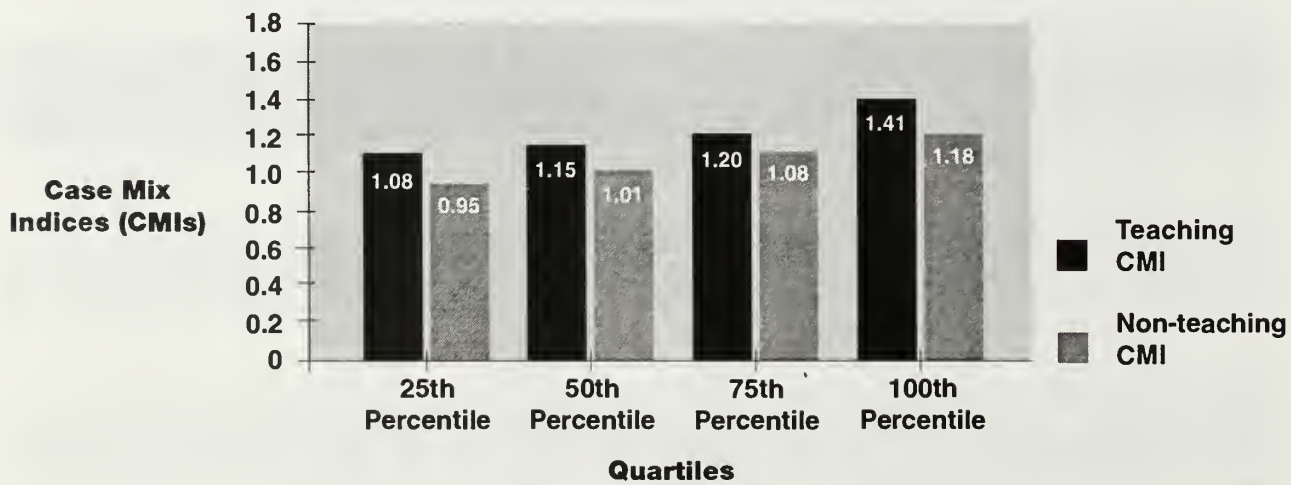

Figure 15 On average, patients who are admitted to a teaching hospital through its emergency department require more intensive resources than patients who are admitted to non-teaching hospitals through the emergency department.

CMIs for Patients Admitted through the ED Are Higher for Trauma Hospitals

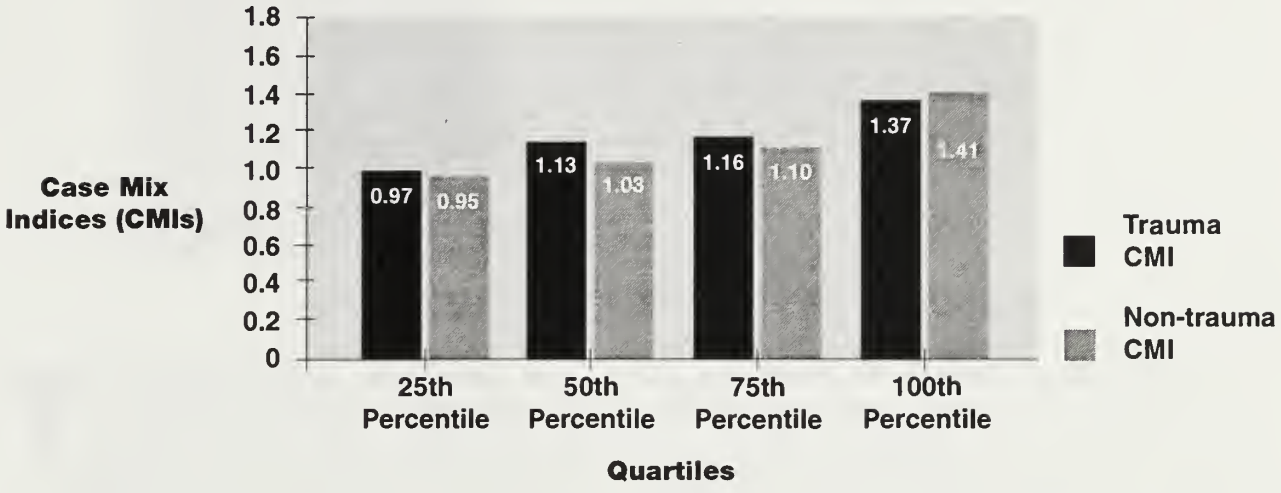

Figure 16 On average, patients who are admitted to a trauma hospital through its emergency department require more intensive resources than patients who are admitted to non-trauma hospitals through the emergency department.

While examining the emergency department discharges admitted to inpatient care, questions arise as to the relative intensity of these patients. Are patients that are admitted through the emergency department sicker, as the urgent nature of their admission might suggest? A comparison of case mix indices for all patients and those from the ED shows that ED patients admitted to inpatient care have higher case mix indices than the overall case mix index (see Figure 14 on page 20). This indicates a higher relative resource intensity in patients admitted through the ED.[1,2]

Available data also allows us to compare those patients admitted through the ED by hospital teaching status and trauma status. Figure 15 on page 20 shows that when comparing all patients admitted through the ED, there is a higher resource intensity in teaching hospitals. Similarly, for patients admitted through the ED, hospitals with trauma centers generally have a higher case mix intensity (see Figure 16 above).

End Notes for A Look at Patients Admitted to the Hospital

1. Case mix indices were developed using the all-payer refined (APR - DRGs) grouping software, version 12, Massachusetts cost weights. The APR - DRGs include four levels of severity.

2. For hospital specific case mix indices, please see Appendix B on page 31.

Conclusion

This report provides information to allow comparisons of emergency department costs for Massachusetts acute care hospitals. It is the first time the Division of Health Care Finance and Policy has focussed on comparing hospital costs within a specific department, and in particular, an outpatient department. The data presented here are intended to serve as a basis for discussion among hospitals, health plans and other purchasers rather than as a statement about the efficiency of individual hospital providers.

In order to account for some of the limitations of the cost information, the data were presented in a number of different peer groups. This should help users of the information identify similar providers and begin an informed dialogue about how to improve on the variation seen in emergency department costs.

Appendix A: Hospital Costs and Charges

Although they are not discussed in the text, charges are included in this appendix because some interested parties expressed a desire to see the data. Please note that all quintiles go from low to high values.

Appendix A includes the following data elements:

- Full Cost per Visit
- Comparable Cost per Visit
- Direct Cost per Visit
- Charge per Visit
- Teaching (n = 19)
- Trauma (n = 10)
- Volume Quintiles
- Salaried Physicians
- EMS Region
- Proxy for Free Care Quintiles
- Percent of Patients Admitted from ED Quintiles
- Average Household Income Quintiles

Peer group quintile amounts may be found in a separate chart at the end of this appendix.

	Hospital	Full Cost per Visit	Comparable Cost per Visit	Direct Cost per Visit	Charge per Visit	Teaching (n=19)
1	ADDISON GILBERT HOSPITAL	184	140	86	280	
2	ANNA JAQUES HOSPITAL	272	199	131	364	
3	ATHOL HOSPITAL	208	136	113	224	
4	ATLANTICARE MEDICAL CENTER	242	177	118	348	
5	BAYSTATE MEDICAL CENTER	275	173	82	317	Y
6	BERKSHIRE MEDICAL CENTER	635	591	63	1,167	Y
7	BETH ISRAEL HOSPITAL	325	176	90	457	Y
8	BEVERLY HOSPITAL	318	291	82	801	
9	BOSTON CITY HOSPITAL	637	444	81	652	Y
10	BOSTON REGIONAL MEDICAL CENTER	222	173	76	389	
11	BRIGHAM & WOMEN'S HOSPITAL	462	273	131	584	Y
12	BROCKTON HOSPITAL	229	168	97	343	
13	CAMBRIDGE HOSPITAL	399	212	170	505	Y
14	CAPE COD HOSPITAL	175	163	69	233	
15	CARNEY HOSPITAL	206	151	64	393	Y
16	CHARLTON MEMORIAL HOSPITAL	333	263	100	561	
17	CHILDREN'S MEDICAL CENTER	261	152	93	259	Y
18	CLINTON HOSPITAL	406	346	122	538	
19	COLUMBIA METROWEST	194	168	65	299	
20	COOLEY-DICKINSON HOSPITAL	215	166	90	259	
21	DEACONESS HOSPITAL	888	634	264	946	Y
22	DEACONESS-GLOVER HOSPITAL	104	77	29	207	
23	DEACONESS-NASHOBA HOSPITAL	150	107	82	191	
24	DEACONESS-WALTHAM HOSPITAL	512	410	94	1,237	
25	EMERSON HOSPITAL	275	249	122	388	
26	FAIRVIEW HOSPITAL	594	543	143	1,175	
27	FALMOUTH HOSPITAL	229	201	58	310	
28	FAULKNER HOSPITAL	203	160	94	273	Y
29	FRANKLIN MEDICAL CENTER	246	205	129	409	
30	GOOD SAMARITAN MEDICAL CENTER	269	206	114	419	
31	HARRINGTON MEMORIAL HOSPITAL	207	159	97	263	
32	HAVERHILL HOSPITAL	125	120	57	303	
33	HEALTH ALLIANCE-BURBANK	189	177	59	506	
34	HEALTH ALLIANCE-LEOMINSTER	207	186	45	353	
35	HEYWOOD MEMORIAL HOSPITAL	279	226	48	634	
36	HILLCREST HOSPITAL	230	221	107	170	
37	HOLY FAMILY HOSPITAL	169	162	57	187	
38	HOLYOKE HOSPITAL	172	164	62	355	
39	HUBBARD REGIONAL HOSPITAL	283	207	127	597	
40	JORDAN HOSPITAL	212	180	72	305	
41	LAHEY HITCHCOCK CLINIC	147	122	51	204	Y

Trauma (n=10)	Volume Quintiles	Salaried Physicians	EMS Region	Proxy for Free Care Quintiles	Percent of Patients Admitted from ED Quintiles	Average Household Income Quintiles
	1	Y	3	3	3	3
	3	N	3	3	2	3
	1	N	2	2	1	4
	4	Y	3	4	4	3
Y	5	Y	1	4	4	1
Y	3	N	1	4	5	2
Y	5	Y	4	5	5	3
	4	Y	3	1	2	4
Y	5	N	4	3	4	2
	1	N	3	2	4	4
Y	4	Y	4	5	5	3
	5	Y	5	5	1	5
	3	Y	4	5	2	4
	5	N	5	4	1	5
	3	Y	4	5	3	3
	5	Y	5	5	4	1
Y	5	Y	4	1	4	2
	2	Y	2	2	1	2
	5	N	4	4	3	5
	3	Y	1	2	2	4
	1	N	4	2	5	3
	4	N	4	1	1	5
	2	N	2	3	1	2
	2	N	4	4	5	5
	2	N	4	2	4	5
	1	Y	1	2	2	2
	3	N	5	1	3	1
	2	N	4	3	5	4
	2	Y	1	3	3	3
	4	N	5	4	4	2
	2	Y	2	4	3	3
	2	N	3	3	1	2
	2	N	2	3	2	4
	3	N	2	5	1	2
	4	N	2	2	1	1
	1	Y	1	1	5	4
	4	N	3	1	3	1
	3	N	1	1	3	1
	1	Y	2	1	2	1
	4	N	5	3	4	3
	5	Y	4	3	1	5

	Hospital	Full Cost per Visit	Comparable Cost per Visit	Direct Cost per Visit	Charge per Visit	Teaching (n=19)
42	LAWRENCE GENERAL HOSPITAL	204	164	94	318	
43	LAWRENCE MEMORIAL HOSPITAL	313	238	139	508	
44	LOWELL GENERAL HOSPITAL	168	127	80	257	
45	MALDEN HOSPITAL	196	131	88	324	
46	MARLBOROUGH HOSPITAL	206	161	90	374	
47	MARTHA'S VINEYARD HOSPITAL	239	207	46	259	
48	MARY LANE HOSPITAL	234	164	97	367	
49	MASSACHUSETTS EYE & EAR INFIRMARY	91	55	29	155	
50	MASSACHUSETTS GENERAL HOSPITAL	321	217	128	388	Y
51	MEDICAL CENTER AT SYMMES	304	205	198	409	
52	MELROSE-WAKEFIELD HOSPITAL	148	134	45	229	
53	MEMORIAL HOSPITAL	205	145	94	268	Y
54	MERCY HOSPITAL	275	180	144	289	
55	MILFORD-WHITINSVILLE HOSPITAL	183	159	65	383	
56	MILTON HOSPITAL	217	178	65	270	
57	MORTON HOSPITAL	185	129	86	273	
58	MOUNT AUBURN HOSPITAL	313	248	77	641	Y
59	NANTUCKET COTTAGE HOSPITAL	276	228	53	386	
60	NEW ENGLAND MEDICAL CENTER	331	230	175	192	Y
61	NEWTON-WELLESLEY HOSPITAL	219	163	80	339	
62	NOBLE HOSPITAL	176	171	64	244	
63	NORTH ADAMS REGIONAL	236	188	122	398	
64	NORWOOD HOSPITAL	197	170	55	308	
65	PROVIDENCE HOSPITAL	226	215	50	552	
66	QUINCY HOSPITAL	640	535	68	1,396	
67	SAINTS MEMORIAL	232	164	109	408	
68	SALEM HOSPITAL	144	131	44	257	
69	SOMERVILLE HOSPITAL	283	204	118	435	
70	SOUTH SHORE HOSPITAL	300	256	114	388	
71	ST. ANNE'S HOSPITAL	275	224	121	359	
72	ST. ELIZABETH'S MEDICAL CENTER	194	144	61	134	Y
73	ST. LUKE'S HOSPITAL	191	134	112	361	
74	ST. VINCENT HOSPITAL	499	391	124	683	Y
75	STURDY MEMORIAL HOSPITAL	325	278	131	516	
76	TOBEY HOSPITAL	404	299	109	775	
77	UNIVERSITY OF MASS. MEDICAL CENTER	467	370	78	811	Y
78	UNIVERSITY HOSPITAL	387	282	202	397	Y
79	WHIDDEN MEMORIAL HOSPITAL	379	275	130	955	
80	WINCHESTER HOSPITAL	174	156	54	330	
81	WING MEMORIAL HOSPITAL	148	164	51	221	

* Data was not available for this provider, therefore, it was not included in this peer group.

Trauma (n=10)	Volume Quintiles	Salaried Physicians	EMS Region	Proxy for Free Care Quintiles	Percent of Patients Admitted from ED Quintiles	Average Household Income Quintiles
	5	Y	3	5	4	4
	2	Y	3	1	5	4
	4	N	3	3	2	5
	2	N	3	4	4	4
	2	Y	4	2	1	4
	1	N	5	*	2	3
	1	Y	1	5	1	1
	2	Y	4	5	1	1
Y	5	Y	4	1	5	4
	1	N	4	1	5	5
	4	N	3	1	3	5
	5	Y	2	1	3	1
	4	N	1	2	4	1
	4	N	2	2	1	4
	1	N	4	1	5	2
	4	N	5	3	2	2
	3	N	4	4	5	5
	1	N	5	1	1	3
Y	3	N	4	5	4	4
	3	N	4	2	3	5
	2	N	1	1	2	1
	1	Y	1	2	4	1
	4	Y	4	4	2	2
	1	N	1	3	3	1
	2	N	4	2	5	1
	5	Y	3	4	2	5
	5	Y	3	4	2	4
	2	N	4	2	1	3
	5	Y	4	3	1	2
	3	N	5	4	3	1
	3	Y	4	5	5	3
	5	Y	5	4	3	1
Y	4	Y	2	5	5	2
	3	Y	5	3	2	5
	2	Y	5	1	3	5
Y	4	Y	2	5	4	2
	1	Y	4	4	2	2
	3	Y	3	5	3	3
	3	N	4	3	5	5
	1	N	1	5	4	3

Note: Dana Farber and New England Baptist do not have emergency departments, and are not included in this report.

Peer Group Quintiles

Quintile	Volume	Proxy for Free Care	Percent of Patients Admitted	Average Household Income
Quintile 1	16,841	$ 389,596	8 %	$ 34,286
Quintile 2	25,094	$ 700,500	11 %	$ 38,740
Quintile 3	32,239	$ 1,179,072	13 %	$ 41,599
Quintile 4	50,506	$ 2,016,832	17 %	$ 43,900
Quintile 5	94,786	$ 10,085,681	56 %	$ 55,485

Appendix B: Case Mix Indices

This appendix shows the case mix indices (CMIs) for acute hospitals in Massachusetts. Please note that all CMIs were calculated using the all payer refined (APR) - DRG grouper version 12 with Massachusetts specific cost weights. The APR - DRGs include a severity adjustment.

Appendix B includes the following data elements:

- CMI for All Patients
- CMI for Patients Admitted through the ED
- Teaching (n = 19)
- Trauma (n = 10)

	Hospital	CMI for All Patients	CMI for Patients Admitted through the ED	Teaching (n=19)	Trauma (n=10)
1	ADDISON GILBERT HOSPITAL	0.9711	1.0495		
2	ANNA JAQUES HOSPITAL	0.8286	0.974		
3	ATHOL HOSPITAL	0.9056	0.903		
4	ATLANTICARE MEDICAL CENTER	1.0679	1.0553		
5	BAYSTATE MEDICAL CENTER	1.057	1.0833	Y	Y
6	BERKSHIRE MEDICAL CENTER	0.8881	0.9298	Y	Y
7	BETH ISRAEL HOSPITAL	0.9982	1.1579	Y	Y
8	BEVERLY HOSPITAL	0.8312	1.0909		
9	BOSTON CITY HOSPITAL	0.7847	0.8757	Y	Y
10	BOSTON REGIONAL MEDICAL CENTER	0.7219	0.8955		
11	BRIGHAM & WOMEN'S HOSPITAL	1.0651	1.1433	Y	Y
12	BROCKTON HOSPITAL	0.8906	1.0147		
13	CAMBRIDGE HOSPITAL	0.7352	0.8395	Y	
14	CAPE COD HOSPITAL	1.0222	1.1224		
15	CARNEY HOSPITAL	1.1886	1.1679	Y	
16	CHARLTON MEMORIAL HOSPITAL	1.0801	1.1663		
17	CHILDREN'S MEDICAL CENTER	1.2248	0.7307	Y	Y
18	CLINTON HOSPITAL	0.855	0.9764		
19	COLUMBIA METROWEST	0.8665	1.0512		
20	COOLEY-DICKINSON HOSPITAL	0.8239	0.9277		
21	DEACONESS HOSPITAL	1.707	1.4071	Y	
22	DEACONESS-GLOVER HOSPITAL	0.9963	0.9682		
23	DEACONESS-NASHOBA HOSPITAL	1.1309	1.1082		
24	DEACONESS-WALTHAM HOSPITAL	0.9264	0.9902		
25	EMERSON HOSPITAL	0.7658	0.9955		
26	FAIRVIEW HOSPITAL	0.8513	1.0478		
27	FALMOUTH HOSPITAL	0.7855	0.8573		
28	FAULKNER HOSPITAL	1.1703	1.2008	Y	
29	FRANKLIN MEDICAL CENTER	0.9542	1.1056		
30	GOOD SAMARITAN MEDICAL CENTER	0.9134	1.0153		
31	HARRINGTON MEMORIAL HOSPITAL	0.8272	0.8827		
32	HAVERHILL HOSPITAL	0.8625	0.7091		
33	HEALTH ALLIANCE-BURBANK	0.8962	0.9804		
34	HEALTH ALLIANCE-LEOMINSTER	0.7642	1.0963		
35	HEYWOOD MEMORIAL HOSPITAL*	0.9777	*		
36	HILLCREST HOSPITAL	0.9136	0.8574		
37	HOLY FAMILY HOSPITAL	0.9216	1.0539		
38	HOLYOKE HOSPITAL	0.9954	1.0117		
39	HUBBARD REGIONAL HOSPITAL	0.9454	0.9076		
40	JORDAN HOSPITAL	0.8613	1.0401		
41	LAHEY HITCHCOCK CLINIC	1.4103	1.104	Y	

	Hospital	CMI for All Patients	CMI for Patients Admitted through the ED	Teaching (n=19)	Trauma (n=10)
42	LAWRENCE GENERAL HOSPITAL	0.8127	0.9661		
43	LAWRENCE MEMORIAL HOSPITAL	1.1106	1.0868		
44	LOWELL GENERAL HOSPITAL	0.7611	1.0514		
45	MALDEN HOSPITAL	0.9631	1.0691		
46	MARLBOROUGH HOSPITAL	1.1735	1.1335		
47	MARTHA'S VINEYARD HOSPITAL	0.7284	0.7977		
48	MARY LANE HOSPITAL	0.7131	0.8759		
49	MASSACHUSETTS EYE & EAR INFIRMARY	0.7951	0.6903		
50	MASSACHUSETTS GENERAL HOSPITAL	1.527	1.3668	Y	Y
51	MEDICAL CENTER AT SYMMES	1.1626	1.0894		
52	MELROSE-WAKEFIELD HOSPITAL	0.8926	1.0764		
53	MEMORIAL HOSPITAL	0.9398	1.2045	Y	
54	MERCY HOSPITAL	1.2788	1.1464		
55	MILFORD-WHITINSVILLE HOSPITAL	0.897	0.9547		
56	MILTON HOSPITAL	0.9814	0.9493		
57	MORTON HOSPITAL	0.9881	1.099		
58	MOUNT AUBURN HOSPITAL	1.056	1.1477	Y	
59	NANTUCKET COTTAGE HOSPITAL	0.6648	0.7005		
60	NEW ENGLAND MEDICAL CENTER	1.4101	1.155	Y	Y
61	NEWTON-WELLESLEY HOSPITAL	0.7583	1.1821		
62	NOBLE HOSPITAL	1.1032	1.0066		
63	NORTH ADAMS REGIONAL	0.9337	1.002		
64	NORWOOD HOSPITAL	0.9282	1.1765		
65	PROVIDENCE HOSPITAL	0.6675	1.0059		
66	QUINCY HOSPITAL	0.9431	1.0395		
67	SAINTS MEMORIAL	1.0539	1.1031		
68	SALEM HOSPITAL	0.8649	1.0278		
69	SOMERVILLE HOSPITAL	1.0582	1.0545		
70	SOUTH SHORE HOSPITAL	0.8282	1.0713		
71	ST. ANNE'S HOSPITAL	0.9618	0.9722		
72	ST. ELIZABETH'S MEDICAL CENTER	1.0942	1.0861	Y	
73	ST. LUKE'S HOSPITAL	1.0275	1.1734		
74	ST. VINCENT HOSPITAL	1.0279	1.1239	Y	Y
75	STURDY MEMORIAL HOSPITAL	0.9252	0.9363		
76	TOBEY HOSPITAL	0.8173	0.9685		
77	UNIVERSITY OF MASS. MEDICAL CENTER	1.5103	1.2552	Y	Y
78	UNIVERSITY HOSPITAL	1.6904	1.361	Y	
79	WHIDDEN MEMORIAL HOSPITAL	0.9696	0.9209		
80	WINCHESTER HOSPITAL	0.7444	0.9545		
81	WING MEMORIAL HOSPITAL	0.9267	0.8981		

*Provider was missing data and not included

Production Notes

Comparing Acute Care Hospital Emergency Department Costs was researched and produced by the staff of the Division of Health Care Finance and Policy. The Division is solely responsible for its content and distribution.

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Report Survey

The Division of Health Care Finance and Policy is soliciting your response to this report, *Comparing Acute Care Hospital Emergency Department Costs,* so that we may continue to provide useful and increasingly timely health care information. Please take a few moments to answer the following questions and feel free to add additional comments:

Respondent Name and Title: _____

Organization: _____

Address: _____

Phone: _____ **Fax:** _____ **E-mail Address:** _____

1. Do you plan to use the data presented to compare your institution to other facilities (or to compare providers in your network)?

   ❒ Yes ❒ No

2. Do you plan to utilize the report to educate other internal parties such as department heads, members of the board, or department staff?

   ❒ Yes ❒ No

3. Do you plan to use this information in the context of contract negotiations with third party payers (or providers)?

   ❒ Yes ❒ No

4. Did the information provided motivate you to investigate identifying ways to improve efficiency?

   ❒ Yes ❒ No

   If "yes", please describe what specific activities have occurred or are planned.

5. Would it be helpful to receive this information on a regular annual basis?

   ❒ Yes ❒ No

6. Is this the most useful format for the information (report format)?

   ❒ Yes ❒ No

If "no", what format would be more useful (Disk? What software? CD-ROM, tape, presentations, etc.)?

7. Do you use other sources for similar type data that you feel are more useful? If so, what sources?

❒ Yes ❒ No

If "yes", please note sources: _____

8. Did the peer groupings facilitate comparisons among the hospitals?

❒ Yes ❒ No

9. Which of the peer groupings were most helpful?

❒ Teaching Status
❒ Trauma Status
❒ Emergency Department Volume
❒ Emergency Medical Services (EMS) Regions
❒ Proxy for Free Care
❒ Percent of Patients Admitted to the Hospital
❒ Average Income Level

10. Was it useful to see the case mix index (CMI) for the patients admitted through the ED?

❒ Yes ❒ No

11. Please rank from 1 to 5 how important it is for the Division of Health Care Finance and Policy to have access to outpatient patient level data in order to provide more detailed outpatient analyses ("1" is not important; "5" is very important).

1 2 3 4 5

12. Please rank the following outpatient categories from 1 to 5 for areas you would like to see more detailed analysis.

☐	Emergency Departments	☐	Clinics
☐	Freestanding Ambulatory Surgical Centers	☐	Physician Offices
☐	Hospital Based Ambulatory Surgical Centers	☐	Other (please list)

13. Would you be willing to provide outpatient patient level data to the Division?

❒ Yes ❒ No

Thank you very much. Please attach any additional comments and fax or mail this survey to:

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