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Deval L. Patrick
Governor

Timothy P. Murray
Lieutenant Governor

JudyAnn Bigby, M.D.
Secretary
Executive Office of Health
and Human Services

Áron Boros,
Commissioner
Division of Health Care
Finance and Policy

Massachusetts Health Care Cost Trends

Efficiency of Emergency Department Utilization in Massachusetts

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Table of Contents

Executive Summary	1
Major Findings	2
1. Introduction	4
2. Results on Overall Trends of ED Utilization	6
3. Results on Preventable/Avoidable ED Visits	15
4. Discussion and Conclusion	22

Appendix A

Appendix B



Executive Summary

As health care costs continue to rise in Massachusetts and across the United States, policymakers are interested in finding ways to make health care system more efficient. As a major component of the health care delivery system, emergency departments (ED) are intended to provide critical services to patients in need of immediate medical attention and sometimes life-threatening conditions. Health care resources are utilized inefficiently and inappropriately when patients seek care at the ED for conditions that are non-emergent, treatable in primary care settings, or avoidable. The objectives of this report are to describe the trends of ED visits and costs in Massachusetts, examine the magnitude of inefficient ED utilization, and investigate various factors behind the ED trends, including the leading clinical conditions and characteristics of ED users.

The data for this report include all outpatient emergency department visits, including Satellite Emergency Facility visits, by patients whose visits result in neither an outpatient observation stay nor an inpatient admission at the reporting facility from FY 2006 to FY 2010. The study population includes patients who presented at the ED and were discharged as outpatients within 24 hours between October 1st, 2005 and September 30th, 2009. This data is submitted by hospitals to the Division of Health Care Finance and Policy (DHCFP) pursuant to 114.1 CMR 17.00.

This study utilizes the Emergency Department Algorithm developed by John Billings and colleagues at New York University. The NYU algorithm assigns the probability that each ICD-9 diagnosis code associated with an ED visit falls into one of the four categories: (1) non-emergent; (2) an emergency for a problem requiring contact with the medical system within 12 hours but treatable in an office visit (primary care treatable); (3) an emergency not treatable in an office visit but preventable or avoidable; and (4) an emergency that is not preventable or avoidable.

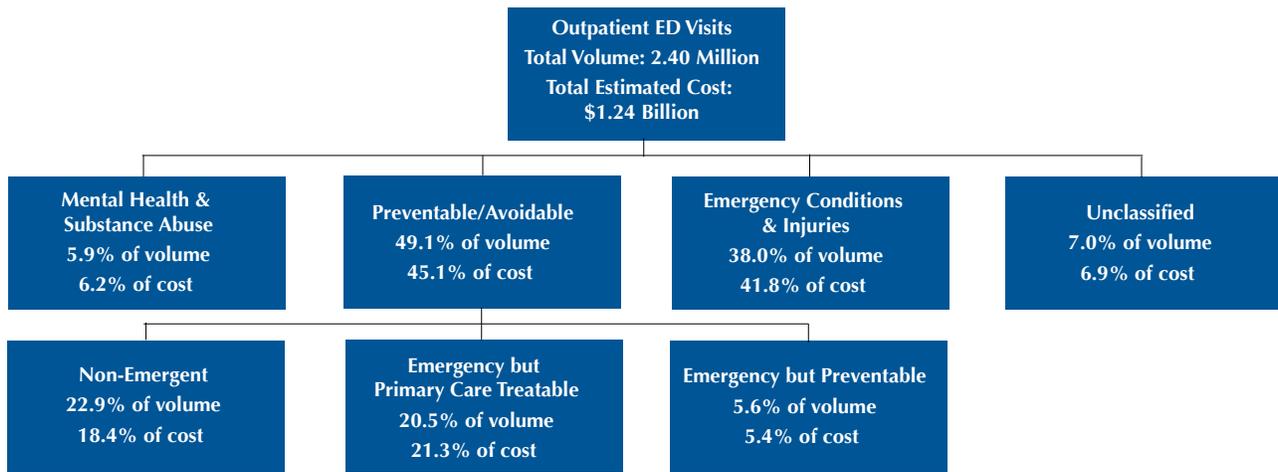
The ED algorithm can identify ED visits associated with primary care treatable conditions that could have been provided in primary care setting or emergencies that could have been avoided if primary care had been delivered at an earlier stage of illness. Following the NYU's ED algorithm, inefficient ED utilization in this report is defined as ED visits that are preventable or avoidable with timely and effective primary care, including three categories: (1) non-emergent; (2) emergency but primary care treatable; and (3) emergency (ED care needed) but preventable/avoidable. The results of this report can help policymakers formulate effective interventions to improve efficiency of ED utilization.



Major Findings

The total volume of outpatient ED visits reached 2.4 million in Massachusetts in FY 2010, which was almost three times more than the total number of inpatient discharges.¹ (Note: Throughout this report, data attributed to specific years refer to the hospital fiscal year.) The preventable/avoidable ED visits accounted for 49 percent of the total ED volume, where non-emergent visits accounted for 23 percent, emergency but primary care treatable visits accounted for 21 percent, and emergency but preventable visits accounted for 6 percent.

Figure 1. Outpatient Emergency Department Visits and Estimated Costs by Category, FY2010



Note: These categories are mutually exclusive based on the NYU ED algorithm.

Between 2006 and 2010, total outpatient ED visits and preventable/avoidable ED visits increased in volume of 6 percent and 6.3 percent, respectively, but the annual growth rates decelerated. The volume of total outpatient ED visits and preventable/avoidable ED visits declined by 0.3 percent and 0.6 percent, respectively, from 2009 to 2010.

The slowing growth of outpatient ED volume coincides with the implementation period of Chapter 58 of the Acts of 2006, suggesting that health care reforms in Massachusetts may be one of the major contributing factors for mitigating ED utilization. More importantly, the downward trend was more substantial for the preventable/avoidable ED visits. The findings can be partially explained by the expansion of health insurance coverage and numerous initiatives on delivery system transformation (e.g. patient centered medical homes initiatives) in the Commonwealth.

¹ The information is based on the FY2010 acute hospital discharge data reported to the Division of Health Care Finance and Policy. Available at: <http://www.mass.gov/eohhs/researcher/physical-health/health-care-delivery/hcf-data-resources/acute-hospital-case-mix-databases.html>



Despite the modest increase in volume, the total estimated costs of providing services for outpatient ED visits (based on hospital cost report analysis and reported charges submitted to DHCFP) increased substantially by 35.6 percent between 2006 and 2010; the average cost per outpatient ED visit increased by 27.9 percent. The total costs for the preventable/avoidable ED visits and the average cost per visit also increased by similar percentages.

This report also shows that total outpatient ED visits, especially the preventable/avoidable ED visits, varied by socio-demographic characteristics. Certain socio-demographic groups (e.g., children, women, minorities, and the uninsured) were more likely to have ED visits for conditions that are preventable/avoidable, suggesting that barriers to primary care access may still exist for certain population groups.

Health care resources are utilized inefficiently and inappropriately when patients seek care at the ED for preventable/avoidable conditions. In order to reduce unnecessary health care expenditures from preventable/avoidable ED visits, availability of healthcare services still needs to be increased, patient behaviors in using ED services must be modified, and disparities in access to health care services should be minimized. Policies to improve the efficiency and effectiveness in ED utilization will also require better health care resource planning and greater coordination among providers in all settings.



1. Introduction

Utilization of emergency services has been rising in the United States since the 1990s, while the number of emergency departments across the country has been decreasing.² As a result, EDs nationwide have experienced increasing patient volume and crowding. The increase in ED visits can be tied in part to provision of medical care to the uninsured, and to evening and weekend care of the insured patients whose regular physicians were unavailable.³ Non-emergent visits are among the common causes of crowding in the ED.⁴ The use of hospital emergency departments for treatment of conditions that are non-emergent or amenable to primary care can be an indicator of access barriers to appropriate primary care or a result of payment systems that inappropriately pay for ED visits.^{5,6} Because of higher payments for ED services than comparable primary care services, the inappropriate use of EDs also contributes to the high cost of health care.^{7,8}

According to the National Hospital Ambulatory Medical Care Survey,⁹ between 1997 and 2007, total annual visits to emergency departments across the United States increased from 94.9 million to 116.8 million, an increase of 23.1 percent. This increase in ED volume outpaced the population growth during the same period.¹⁰ Among the population who visited EDs, older adults (age 65 and over), non-Hispanic black persons, poor persons, women, and persons with Medicaid coverage were more likely to have had at least one ED visit in a 12-month period than those in other age, race/ethnicity, income, and insurance groups from 1997 through 2007.¹¹ In 2007, about 65 percent of ED visits in the United States occurred during non-business hours (5 pm to 8 am Monday through Friday and on weekends).¹²

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- 2 Niska, R., Bhuiya, F., & Xu, J. (2010). National Hospital Ambulatory Medical Care Survey: 2007 emergency department summary. National Health Statistics Reports, No. 26. Hyattsville, MD: National Center for Health Statistics.
 - 3 Institute of Medicine (2006). Hospital-based emergency care: at the breaking point. Washington, DC: National Academies Press.
 - 4 Hoot, N.R., & Aronsky, D. (2008). Systematic review of emergency department crowding: causes, effects, and solutions. *Annals of Emergency Medicine*, 52(2), 126-136.
 - 5 Sarver, J.H., Cydulka, R.K., & Baker, D.W. (2002). Usual source of care and nonurgent emergency department use. *Academic Emergency Medicine*, 9(9), 916-923.
 - 6 Oster, A., & Bindman, A.B. (2003). Emergency department visits for ambulatory case sensitive conditions: insights into preventable hospitalizations. *Medical Care*, 41(2), 198-207.
 - 7 Young, G.P., Wagner, M.B., Kellermann, A.L., Ellis, J., & Bouley, D. (1996). Ambulatory visits to hospital emergency departments: patterns and reasons for use. *JAMA*, 276(6), 460-465.
 - 8 McWilliams, A., Tapp, H., Barker, J., & Dulin, M. (2011). Cost analysis of the use of emergency departments for primary care services in Charlotte, North Carolina. *North Carolina Medical Journal*, 72(4), 265-271.
 - 9 The National Hospital Ambulatory Medical Care Survey is an annual national survey of hospital EDs conducted by the National Center for Health Statistics.
 - 10 The US population estimate was 267.8 million in 1997 and 301.3 million in 2007, a 12.5% increase. Data obtained from US Census Bureau. <http://www.census.gov/popest/data/intercensal/index.html> Accessed March 9, 2012.
 - 11 Tang, N., Stein, J., Hsia, R., Maselli, J.H., & Gonzales, R. (2010). Trends and characteristics of US emergency department visits, 1997-2007. *JAMA*, 304(6), 664-670.
 - 12 Niska et al. (2010).



Hospital emergency departments are not designed to provide primary care services to patients. The high number of ED visits that are primary care treatable leads to concerns about the inefficiency in resource utilization and allocation.¹³ Lack of access to primary care and having financial and non-financial barriers to care other than ED are among the main reasons that conditions that are preventable or treatable through primary care end up in the ED.^{14,15} It is important to understand the characteristics of ED users and identify their medical and psychosocial needs when developing interventions and health policies to reduce the number of preventable/avoidable ED visits.

As health care costs continue to rise in Massachusetts and across the United States, policymakers are increasingly interested in finding ways to make the health care system more efficient. The objectives of this report are to examine the magnitude of inefficient ED utilization in Massachusetts and investigate the leading clinical conditions and characteristics of ED users with regard to age, gender, race and ethnicity, and insurance type. In this report, inefficient ED utilization is defined as ED visits that are preventable or avoidable with timely and effective primary care, including three categories: (1) non-emergent; (2) emergency but primary care treatable; and (3) emergency (ED care needed) but preventable/avoidable.¹⁶ The results of this report can guide policymakers in formulating effective interventions to increase the efficiency of ED utilization.

13 Bernstein, S.L. (2006). Frequent emergency department visitors: the end of inappropriateness. *Annals of Emergency Medicine*, 48(1), 18-20.

14 Young, G.P., Wagner, M.B., Kellerman, A.L., Ellis, J., & Bouley, D. (1996). Ambulatory visits to hospital emergency departments. *JAMA*. 276(6), 460-465.

15 Billings, J., Parikh, N., & Mijanovich, T. (2000). Emergency department use in New York City: a substitute for primary care. Issue Brief, No. 433. New York, NY: Commonwealth Fund.

16 Billings, J., Parikh, N., & Mijanovich, T. (2000). Emergency department use: the New York story. Issue Brief, No. 434. New York, NY: Commonwealth Fund.



2. Results on Overall Trends of ED Utilization

Volume

Between 2006 and 2010, the total number of outpatient ED visits in Massachusetts increased modestly by 6 percent (with an average annual increase of 1.5 percent), from 2.26 million to 2.40 million. During the same time period, the number of preventable/avoidable outpatient ED visits had a similar level of increase of 6.3 percent (Table 1).

Table 1. Number of Outpatient ED Visits in Massachusetts, FY2006 and FY2010

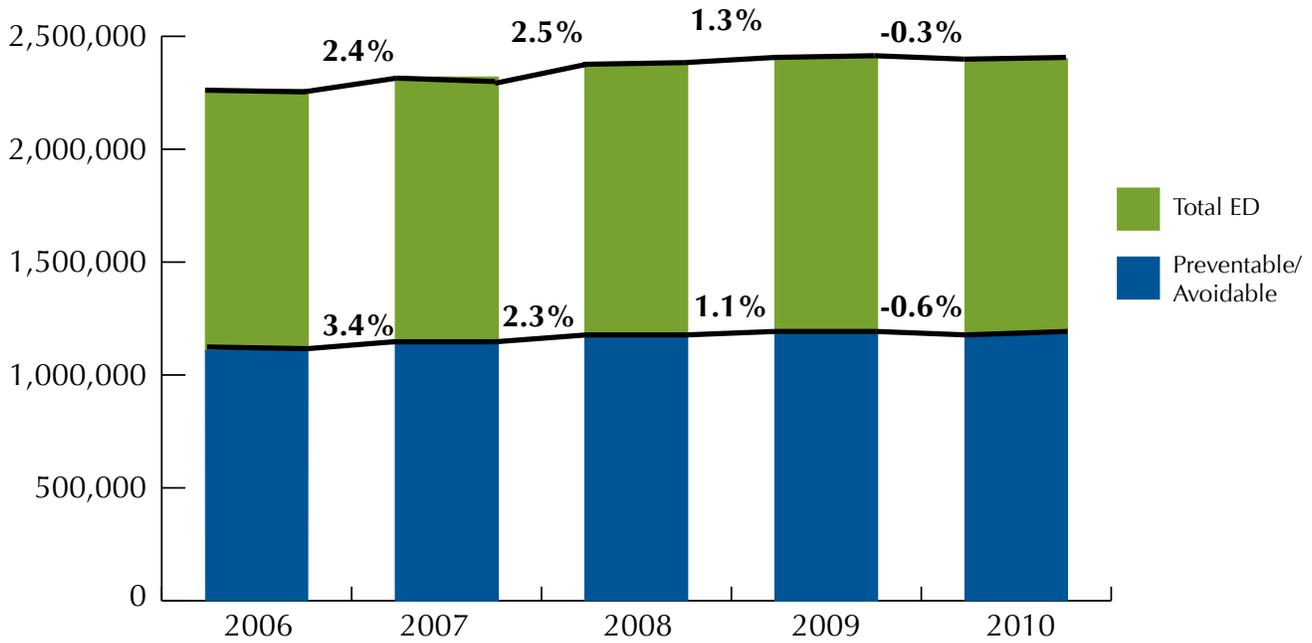
	2006	2010	% Change
Total ED Visits	2,265,064	2,401,315	6.0%
Preventable/Avoidable ED Visits	1,108,002	1,178,068	6.3%

From 2006 to 2010, there is a clear downward trend in the annual growth rate for both total ED visits and preventable/avoidable ED visits (Figure 2). The annual growth rate for total ED visits remained at around 2.5 percent between 2006 and 2008. Then the annual growth rate dropped to 1.3 percent between 2008 and 2009. The volume of total ED visits decreased 0.3 percent from 2009 to 2010. The same pattern was observed for preventable/avoidable ED visits. Preventable/avoidable ED visits increased by 3.4 percent between 2006 and 2007 but decreased by 0.6 percent between 2009 and 2010.

Generally, the distribution of different types of outpatient ED visits in Massachusetts remained stable over the period of 2006-2010. In 2010, preventable/avoidable ED visits accounted for the largest share of total ED visits (49 percent), followed by emergency visits at 38 percent (Table 2). For the three subcategories of preventable/avoidable ED visits, the non-emergent ED visits accounted for 23 percent of total ED visits, the emergency but primary care treatable ED visits accounted for 21 percent, and the emergency but avoidable ED visits accounted for 6 percent.



Figure 2. Annual Growth Rate for Outpatient ED Visits in Massachusetts, FY2006-FY2010



Note: The percentage above the bottom trend line corresponds to the percent change in preventable/avoidable visits; the percentage above the upper trend line corresponds to the percent change in total ED visits (Preventable/Avoidable and Non-Preventable/Avoidable combined).

Table 2. Distribution of Outpatient ED Visits in Massachusetts, FY2010

ED Category	Visit	Percent
Preventable/Avoidable	1,178,068	49%
Non-Emergent	550,321	23%
Emergency but Primary Care Treatable	492,851	21%
Emergency but Preventable	134,896	6%
Emergency	912,483	38%
Mental health & Substance Abuse	141,677	6%
Unclassified	169,086	7%
Total	2,401,315	100%



Cost

The estimated resource costs of providing services for total ED visits increased by 35.6 percent, from \$913 million in 2006 to nearly \$1.24 billion in 2010 (Table 3). At the same time, the estimated resource costs for preventable/avoidable ED visits increased at a similar rate. This is a marked contrast to the modest increase of ED volume.

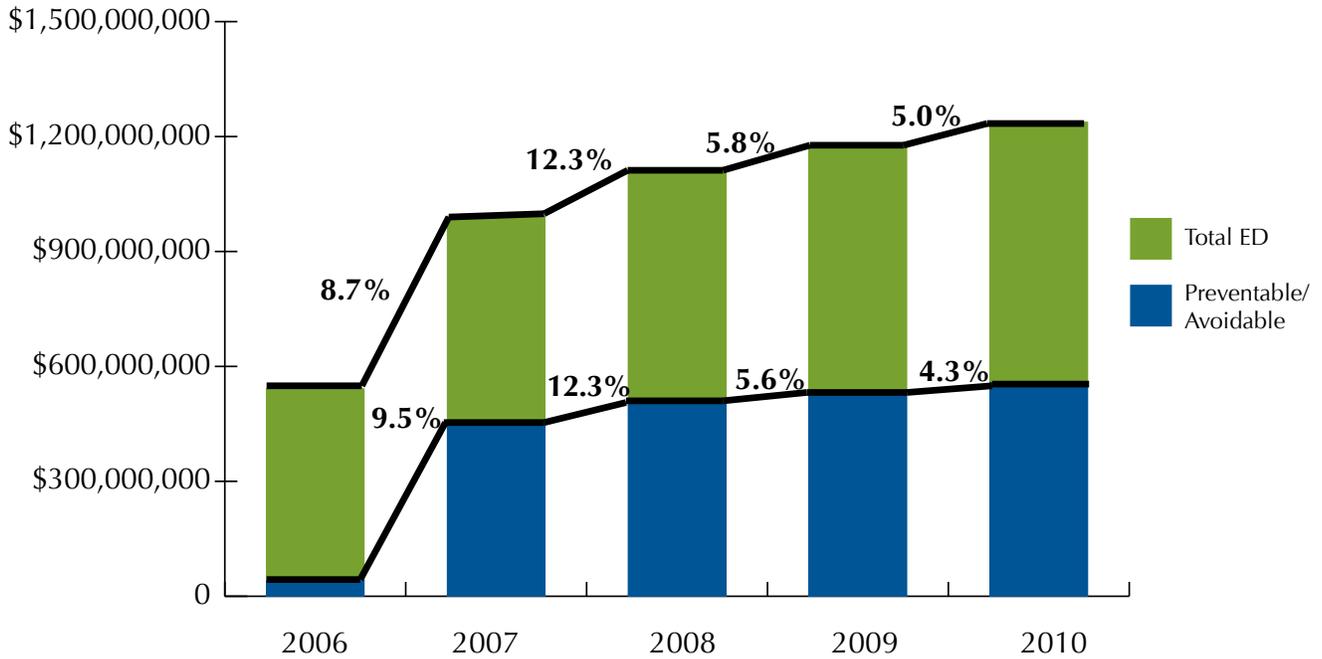
Table 3. Total Costs of Outpatient ED Visits in Massachusetts, FY2006 and FY2010

	2006	2010	% Change
Total ED costs	\$912,529,724	\$1,237,595,793	35.6%
Preventable/Avoidable ED Costs	\$412,087,090	\$558,089,302	35.4%

However, the growth rate of total costs has been slowing in recent years. The annual growth rate in both total ED costs and preventable/avoidable ED costs dropped substantially over the last three years from a 12.3 percent growth between 2007 and 2008 to a 5 percent increase between 2009 and 2010 (Figure 3).



Figure 3. Annual Growth Rate for Outpatient ED Costs in Massachusetts, FY2006-FY2010



Note: The percentage above the bottom trend line corresponds to the percent change in preventable/avoidable visits; the percentage above the upper trend line corresponds to the percent change in total ED visits (Preventable/Avoidable and Non-Preventable/Avoidable combined).

Preventable/avoidable ED visits accounted for 45 percent of total ED costs in 2010, followed by emergency visits at 42 percent (Table 4). The distribution of estimated resource costs for total ED visits has been fairly stable since 2006. For the three subcategories of preventable/avoidable ED visits, the non-emergent ED visits accounted for 18 percent of total ED visits, the emergency but primary care treatable ED visits accounted for 21 percent, and the emergency but avoidable ED visits accounted for 5 percent. In general, emergency ED visits cost more than preventable/avoidable ED visits and other types of ED visits. Average cost per emergency ED visit was \$566, while average cost per preventable/avoidable ED visit was \$474 in 2010. Among the three types of preventable/avoidable ED visits, the average cost per visit was the lowest for non-emergent visits at \$413, while the average cost for emergency but primary care treatable visits was the highest at \$535, and the average cost for emergency but preventable visits was \$496.



Table 4. Distribution of Preventable/Avoidable ED Cost in FY2010 in Massachusetts

ED Category	Cost	Percent	Average Cost per Visit
Preventable/Avoidable	\$558,089,302	45%	\$474
Non-Emergent	\$227,514,730	18%	\$413
Emergency but Primary Care Treatable	\$263,630,328	21%	\$535
Emergency but Preventable	\$66,944,244	5%	\$496
Emergency	\$516,704,902	42%	\$566
Mental health & Substance Abuse	\$76,435,186	6%	\$540
Unclassified	\$86,366,403	7%	\$511
Total	\$1,237,595,793	100%	\$515

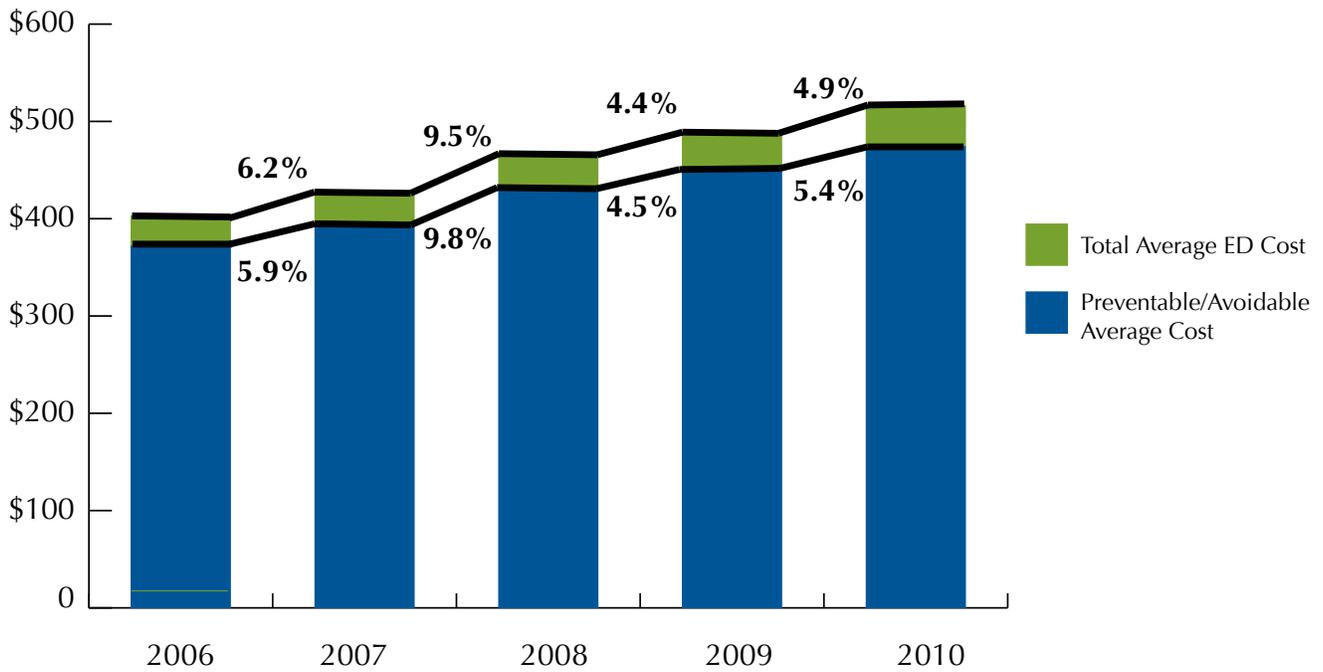
Total ED cost increased much faster than total ED volume from 2006 to 2010, which suggests that the increase in the average cost per ED visit, rather than increases in overall utilization, contributed to the increase of total ED cost. Table 5 shows that the average costs for both total ED visits and preventable/avoidable ED visits grew substantially from 2006 to 2010. The annual growth rate in the average ED cost per visit is very closely related to the annual changes in total ED costs (Figure 4).



Table 5. Average Cost per Outpatient ED Visit in Massachusetts, FY2006 and FY2010

	2006	2010	% Change
Average Cost per Total Outpatient ED Visit	\$403	\$515	27.9%
Average Cost per Preventable/Avoidable ED Visit	\$372	\$474	27.4%

Figure 4. Annual Growth Rate for Average Cost per ED Visit in Massachusetts, FY2006-FY2010



Note: The percentage above the bottom trend line corresponds to the percent change in preventable/avoidable visits; the percentage above the upper trend line corresponds to the percent change in total ED visits (Preventable/Avoidable and Non-Preventable/Avoidable combined).



Time Distribution

There are 168 hours in a week. The regular office hours (8 am to 5 pm Monday through Friday) account for about 27 percent of hours per week, while non-office hours (including off hours and weekends) account for 73 percent of total hours per week. In 2010, 36 percent of total ED visits occurred during regular business hours, while 63 percent of total visits occurred during non-office hours (Table 6). Preventable/avoidable ED visits had similar time distribution as total ED visits. This time distribution was fairly stable over the period of 2006-2010.

Table 6. Distribution of ED Visits by Office Hours in Massachusetts, FY2010

	Total ED Visits	Preventable /Avoidable ED Visits*
8:00 am to 5:00 pm (M-F)	36%	36%
Off Hours (M-F)	35%	34%
Saturday & Sunday	29%	29%
Total	100%	100%

* The numbers do not add up to 100 due to rounding.



Patient Characteristics

Overall, the distribution of patient characteristics seems to be similar between the total ED visits and the preventable/avoidable ED visits (Table 7). For the privately insured ED users, about 47.6 percent of total outpatient ED visits were attributable to visits for preventable/avoidable conditions (Figure 5). Among the uninsured ED patients, 54.4 percent of their visits were considered as preventable/avoidable. For those covered by Medicaid and CommCare, preventable/avoidable visits accounted for 55 percent and 54 percent, respectively, of total outpatient ED visits.

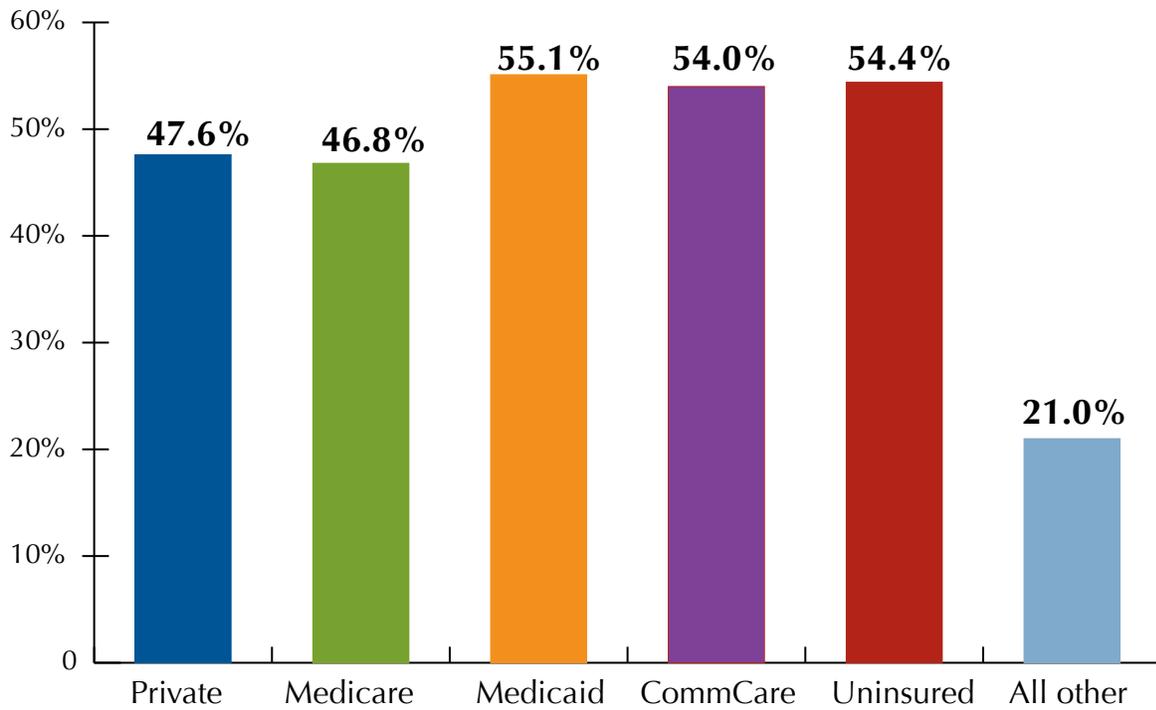
Table 7. Distribution of Outpatient ED Visits in Massachusetts by Patient Characteristics, FY2010

	MA Population*	Total ED Visits	Preventable/Avoidable ED Visits
Age			
Age 0-4	5.6%	8%	10%
Age 5-17	16.1%	12%	11%
Age 18-24	10.4%	14%	15%
Age 25-44	26.5%	32%	32%
Age 45-64	27.7%	22%	21%
Age 65 and older	13.8%	12%	11%
Gender			
Women	51.6%	52%	57%
Men	48.4%	48%	43%
Race/Ethnicity			
White, non-Hispanic	76.1%	69%	65%
Black, non-Hispanic	6.0%	10%	12%
Asian, non-Hispanic	5.3%	2%	2%
Hispanic	9.6%	14%	17%
Other race	3.0%	4%	5%
Insurance Type			
Private	67.7%	37%	36%
Medicare	14.5%	17%	16%
Medicaid	13.7%	29%	32%
CommCare	2.4%	3%	4%
Uninsured	0.3%	9%	10%
All Other	1.3%	5%	2%

* The demographic distributions among Massachusetts residents are based on the information from 2010 US Census data. The distribution of insurance coverage is based on the Key Indicators and 2010 Massachusetts Household Insurance Survey from the Division of Health Care Finance and Policy.



Figure 5. Percentage of Preventable/Avoidable ED among Total Outpatient ED Visits by Insurance Type, FY2010



3. Results on Preventable/Avoidable ED Visits

The previous section shows that the overall preventable/avoidable ED visits had a very moderate growth of 6.3 percent from year 2006 to 2010 and the annual growth rate had a downward trend over this period. In this chapter, the preventable/avoidable ED visits are analyzed in detail to examine the utilization trends of different types of preventable/avoidable ED visits.

Preventable/avoidable ED visits are categorized into three types:

- (1) Non-emergent ED visits: visits for conditions that do not require care within 12 hours, e.g., sore throat or back pain.
- (2) Emergency but primary care treatable ED visits: visits for conditions that require care within 12 hours but could have been treated in a primary care setting.
- (3) Emergency but preventable ED visits: visits for conditions that require emergency care within 12 hours, but the emergency nature of the condition could have been avoided if timely and effective ambulatory care had received during the episode of illness, e.g., asthma, diabetes, congestive heart failure.

Volume

Non-emergent ED visits increased by 8.9 percent from 505,230 in 2006 to 550,321 in 2010, the largest increase among the three types of the preventable/avoidable ED visits. Emergency but primary care treatable ED visits increased by 6.3 percent during the same period. Unlike the volume increase in the other two categories of preventable/avoidable ED visits, emergency but preventable ED visits experienced a decline in volume by 3.1 percent.

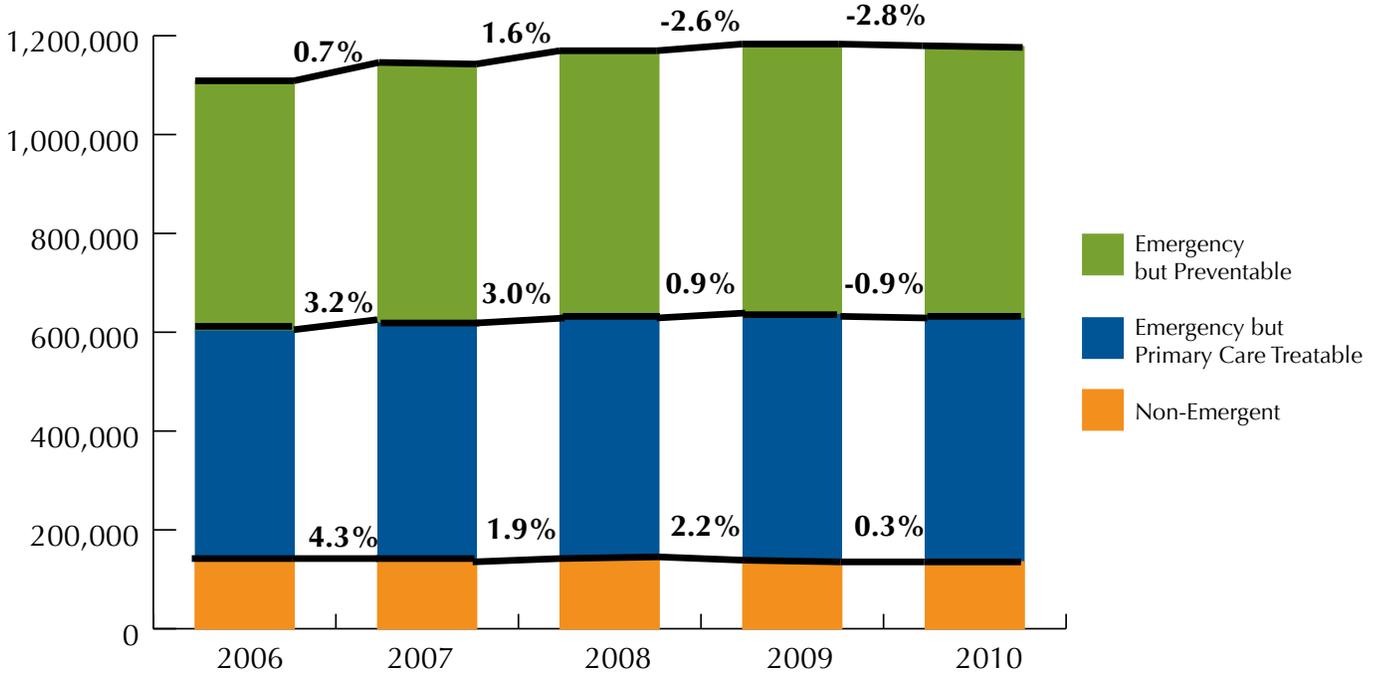
Table 8. Number of Preventable/Avoidable ED Visits in Massachusetts, FY2006 and FY2010

	2006	2010	% Change
Non-Emergent ED Visits	505,230	550,321	8.9%
Emergency but Primary Care Treatable ED Visits	463,567	492,848	6.3%
Emergency but Preventable ED Visits	139,204	134,896	-3.1%
Total Preventable/Avoidable ED Visits	1,108,001	1,178,065	6.3%



All three types of preventable/avoidable ED visits showed a deceleration in their annual growth rate from 2006 to 2010. The volume of emergency but primary care treatable ED visits increased by less than one percent between 2008 and 2009 and decreased by 0.9 percent between 2009 and 2010 (Figure 6). The number of non-emergent ED visits started to decline after 2008, with a 2.6 percent decrease in volume between 2008 and 2009, and a 2.8 percent decrease between 2009 and 2010. This downward trend is more substantial than the other two categories of preventable/avoidable ED visits.

Figure 6. Annual Growth Rate of Preventable/Avoidable ED Visits, FY2006-FY2010



ED Costs

In contrast to the increases in volume, the estimated resource costs of providing services for all three types of preventable/avoidable ED visits had increased substantially over the period of 2006-2010. Similar to the trends in volume, non-emergent ED visits had the largest increase, 40 percent, in total costs among the three types of preventable/ avoidable ED visits (Table 9). The total costs of emergency but primary care treatable ED visits increased by 41.2 percent during the same period, followed by emergency but preventable ED visits at 14.9 percent.

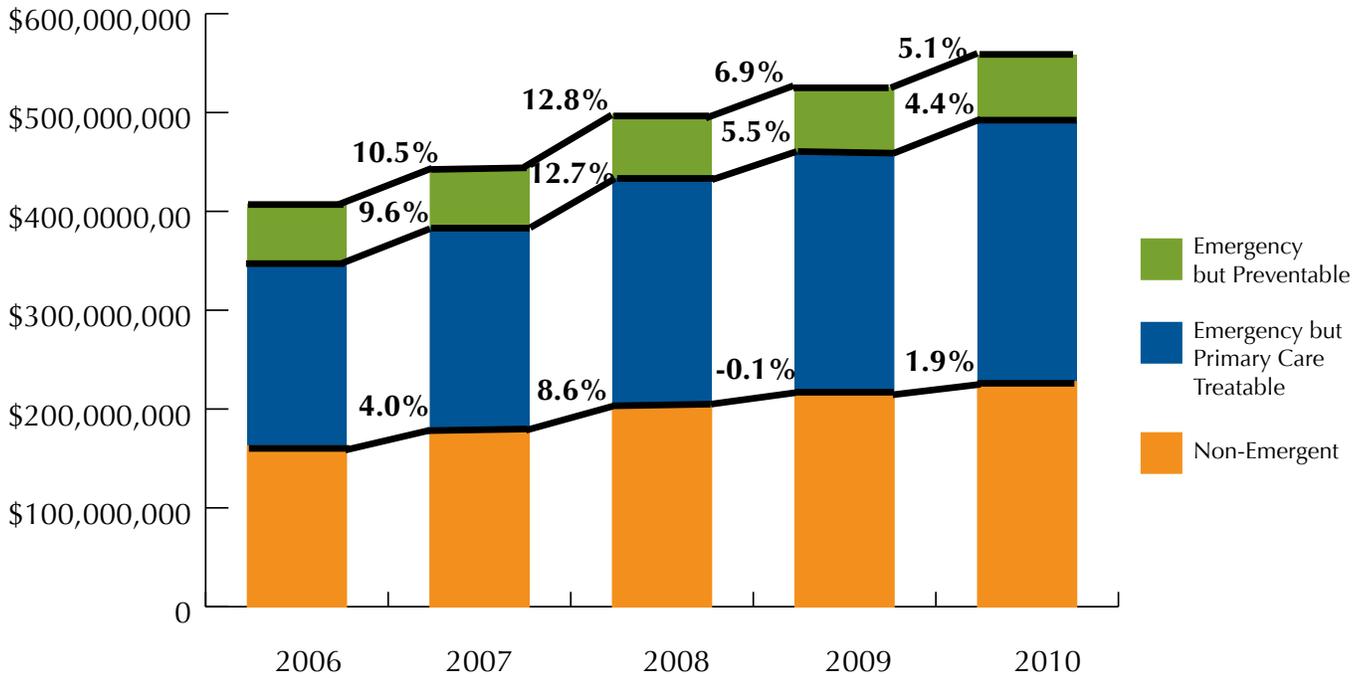
Table 9. Total Costs of Preventable/Avoidable ED Visits in Massachusetts, FY2006 and 2010

	2006	2010	% Change
Non-Emergent ED Visits	\$162,474,639	\$227,514,730	40.0%
Emergency but Primary Care Treatable ED Visits	\$186,664,000	\$263,630,328	41.2%
Emergency but Preventable ED Visits	\$58,286,600	\$66,944,244	14.9%
Total Costs of Preventable/Avoidable ED Visits	\$412,087,090	\$558,089,302	35.4%

After a double-digit surge from 2006 to 2007 and from 2007 to 2008, the annual growth rate of total ED costs for three categories of preventable/avoidable ED visits started to slow down (Figure 7).



Figure 7. Annual Growth Rate of Total Costs for Preventable/Avoidable ED Visits, FY2006-FY2010



From 2006 to 2010, the average cost per ED visit for all three preventable/avoidable ED categories had increased substantially. During the same time period, average cost per emergency but primary care treatable ED visit had the highest increase of 32.8 percent. Non-emergent ED visits had the lowest average cost per ED visit of \$413 in 2010, which was much lower than the other two categories, \$535 and \$496 (Table 10).

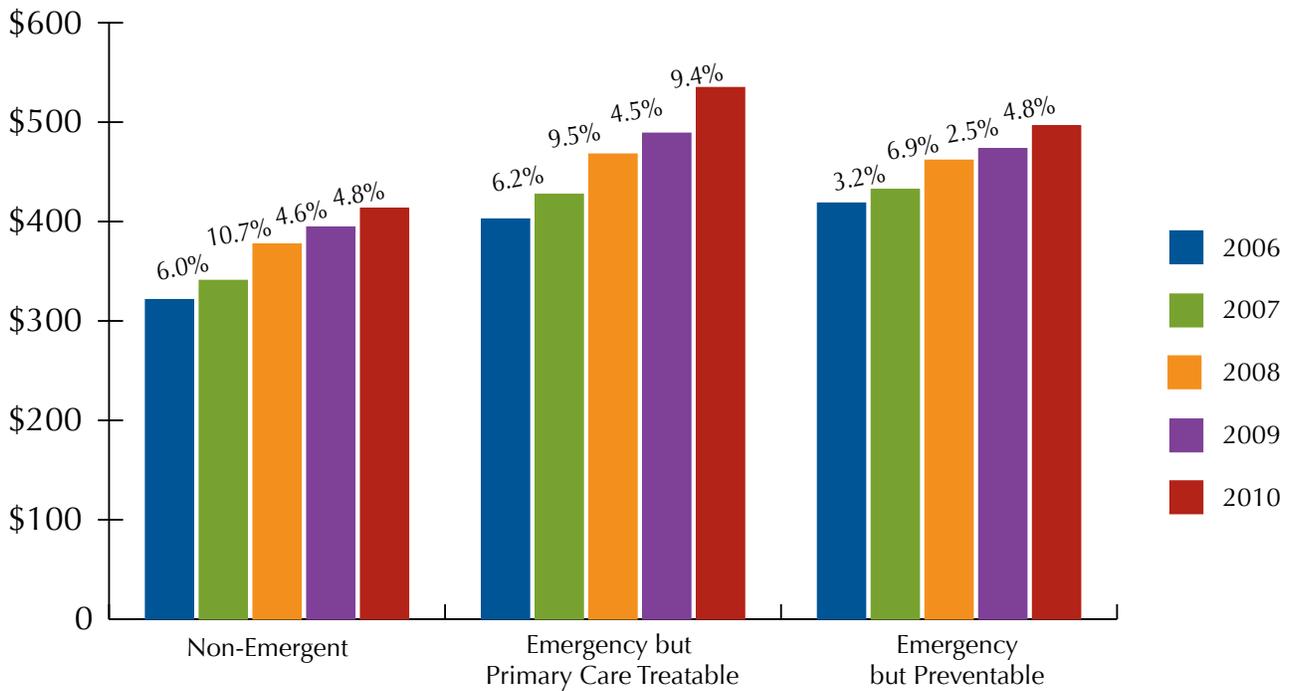
Table 10. Average Cost per Preventable/Avoidable ED Visit in Massachusetts, FY2006 and FY2010

	2006	2010	% Change
Average Cost per Non-Emergent ED Visit	\$322	\$413	28.6%
Average Cost per Emergency but Primary Care Treatable ED Visit	\$403	\$535	32.8%
Average Cost per Emergency but Preventable ED Visit	\$419	\$496	18.5%
Average Cost per Preventable/Avoidable ED Visit	\$372	\$474	27.4%



The average cost per ED visit for all three categories continued to increase over the period of 2006-2010, but the annual growth rate fluctuated. The annual growth rate of average cost per non-emergent ED visit increased by 6.0 percent between 2006 and 2007 and peaked at 10.7 percent between 2007 and 2008 (Figure 8). The annual growth rate dropped to a low of 4.6 percent between 2008 and 2009 and then climbed to 4.8 percent between 2009 and 2010. Similar trends in changes in average cost per visit were shared by the other two categories of preventable/avoidable ED visits.

Figure 8. Annual Growth Rate of Average Cost per Preventable/Avoidable ED Visit, FY2006-2010



Patient Characteristics

The distributions of patient characteristics were fairly similar among all three categories of preventable/avoidable ED visits. The non-elderly adult population (age 18 to 64) accounted for about 65 to 71 percent of ED visits for the three preventable/avoidable ED categories, while the under age 18 population and the elderly population (age 65 and above) accounted for about 30 to 34 percent of the visits (Table 11). Adults age 25 to 44 accounted the largest proportion of the visits (29 to 34 percent), women accounted for more than half of the visits, the non-Hispanic white population accounted for two-third of the visits, and the populations covered by public insurance programs (Medicare, Medicaid, and CommCare) accounted for more than half of the preventable/avoidable ED visits.



Table 11. Distribution of Preventable/Avoidable ED Visits by Patient Characteristics, FY2010

	Non-Emergent	Emergency but Primary Care Treatable	Emergency but Preventable
Age			
Age 0-4	9%	11%	12%
Age 5-17	11%	11%	12%
Age 18-24	16%	15%	14%
Age 25-44	34%	30%	29%
Age 45-64	21%	22%	22%
Age 65 and up	10%	11%	10%
Gender			
Women	58%	56%	54%
Men	42%	44%	46%
Race/Ethnicity			
White, non-Hispanic	64%	65%	66%
Black, non-Hispanic	12%	11%	11%
Asian, non-Hispanic	2%	2%	2%
Hispanic	17%	17%	17%
Other race	5%	5%	4%
Insurance			
Private	34.9%	38.7%	36%
Medicare	15.1%	16.2%	19%
Medicaid	32.8%	31.4%	32%
CommCare	7.8%	3.6%	7%
Uninsured	6.5%	8.0%	6%
All Other	3.1%	2.1%	1%



Clinical Conditions

The top 10 clinical conditions accounted for about 34 percent of the visits for both non-emergent and emergency but primary care treatable ED categories, while the 10 leading conditions accounted for 63.3 percent of emergency but preventable ED visits (Table 12). There was little overlap in the top 10 clinical conditions among these three preventable/avoidable ED categories. Since the emergency but preventable ED visits tend to be more concentrated among certain clinical conditions (e.g., asthma and pneumonia), policymakers and healthcare providers can target these conditions to decrease ED utilization.

Table 12. Top 10 Clinical Conditions for Each of the Three Categories of Preventable/Avoidable ED Visits, FY2010

Non-Emergent ED Visits		Emergency but Primary Care Treatable ED Visits		Emergency but Preventable ED Visits	
Condition	%	Condition	%	Condition	%
Headache	6.1%	Acute upper respiratory infections of unspecified site	6.0%	Asthma, unspecified, with (acute) exacerbation	15.1%
Lumbago	5.4%	Abdominal pain, unspecified site	5.5%	Asthma, unspecified, unspecified status	9.1%
Acute pharyngitis	3.9%	Abdominal pain, other specified site	3.9%	Pneumonia, organism unspecified	8.7%
Pain in soft tissues of limb	3.4%	Unspecified otitis media	3.4%	Urinary tract infection, site not specified	6.1%
Urinary tract infection, site not specified	2.8%	Acute bronchitis	3.3%	Dehydration	6.1%
Unspecified disorder of the teeth and supporting structures	2.8%	Chest pain, other	2.7%	Acute upper respiratory infections of unspecified site	4.8%
Fever, unspecified	2.8%	Fever, unspecified	2.7%	Other convulsions	4.1%
Dizziness and giddiness	2.6%	Painful respiration	2.2%	Cellulitis and abscess of leg, except foot	4.0%
Unspecified backache	2.4%	Bronchitis, not specified as acute or chronic	2.2%	Cellulitis and abscess of upper arm and forearm	2.8%
Other current maternal conditions classifiable elsewhere, antepartum	2.2%	Cellulitis and abscess of leg, except foot	2.2%	Acute bronchitis	2.6%
Total	34.5%		34.1%		63.3%



4. Discussion and Conclusion

From 2006 to 2010, the preventable/avoidable ED visits demonstrated similar trends as total outpatient ED visits. Although the total number of visits increased by 6 percent between 2006 and 2010, the annual growth rates for the outpatient ED volume steadily declined. The preventable/avoidable ED visits accounted for nearly half of total outpatient ED visits. Within the three categories of the preventable/avoidable ED visits, the emergency but preventable ED visits had the largest drop in volume. The total number of the emergency but preventable ED visits decreased by 3.1 percent between 2006 and 2010; this was the only category of the preventable/avoidable ED visits that experienced an actual reduction in volume. The volume of emergency but primary care treatable ED visits increased by 6.3 percent from 2006 to 2010, while the non-emergent ED visits had the highest total increase in volume of 8.9 percent over the same period.

The declining trends in the ED volume coincides with the implementation period of Chapter 58 of the Acts of 2006, suggesting that health care reforms in Massachusetts may be one of the major contributing factors for mitigating ED utilization. More importantly, the downward trend was more substantial for the preventable/avoidable ED visits. The findings can be partially explained by the expansion of health insurance coverage and numerous initiatives on delivery system transformation (e.g., patient-centered medical homes initiatives) in the Commonwealth. The impacts of the financial crisis and recession between 2007 and 2009 on health care utilization in general could also be a factor.

Compared to the modest increase in volume, the total costs of outpatient ED visits increased substantially by 35.6 percent between 2006 and 2010 and the average cost per outpatient ED visit increased by 27.9 percent. Similarly, the total costs of preventable/avoidable ED visits and the average cost per visit also increased by 35.4 percent and 27.4 percent, respectively.

About one third of total outpatient ED visits occurred during regular office hours (8:00am – 5:00pm from Monday to Friday) and two-thirds of the visits took place after office hours and on the weekends. This time distribution has been stable for the preventable/avoidable ED visits as well. This phenomenon suggests that patients tend to utilize the ED when regular health care services are not available.

Patients who seek preventable/avoidable ED care during the regular office hours may lack adequate financial access to primary care, have difficulty obtaining appointments with their primary care providers, or just use the ED for convenience.¹⁷ Further analysis is necessary to determine effective ways to reduce inefficient ED utilization during regular office hours. For preventable/avoidable ED visits that occurred during off-hours, expanding primary care office hours may help improve provider accessibility and divert patients who are seeking non-urgent care away from the ED.

17 Howard, M.S., Davis, B.A., Anderson, C., Cherry, D., Koller, P., & Shelton, D. (2005). Patients' perspective on choosing the emergency department for nonurgent medical care: a qualitative study exploring one reason for overcrowding. *Journal of Emergency Nursing*, 31(5), 429-435.



The findings of this study demonstrate that total outpatient ED visits, especially preventable/avoidable ED visits, varied by socio-demographic characteristics. Certain socio-demographic groups (e.g., children, women, minorities, and the uninsured) are more likely to have ED visits for conditions that are preventable/avoidable, suggesting that barriers to accessing primary care services may still exist for certain population groups.

As a major component of the health care delivery system, EDs are intended to provide critical services to patients in need of immediate medical attention and sometimes life-threatening conditions. Health care resources are utilized inefficiently and inappropriately when patients seek care at the ED for preventable/avoidable conditions. Policies to improve the efficiency in ED utilization should focus on improving accessibility and availability of primary care services for patients with particular conditions and certain population groups. Better health care resource planning and greater coordination among providers at all settings will lead to more efficient use of ED services.





Division of Health Care Finance and Policy

Two Boylston Street
Boston, Massachusetts 02116

Phone: (617) 988-3100

Fax: (617) 727-7662

Website: www.mass.gov/dhcfp

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