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Emergency Department Charges for Asthma-Related Outpatient Visits by Insurance Status

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Abstract

Though Americans make 1.8 million asthma-related outpatient visits to the emergency department (ED) annually, little is known about the episodic charges for asthma care in the ED. We therefore sought to assess the bills patients could face for acute asthma incidents by examining hospital charges for asthma-related outpatient ED visits. We performed a nationwide, cross-sectional study of 2.9 million weighted asthma-related outpatient ED visits from 2006–2008 using data from the Medical Expenditure Panel Survey. We found that the average charge for an outpatient ED visit was \$1,502 (95% CI \$1,493–\$1,511). The charges did not vary significantly by insurance group but did increase significantly with age. Our results indicate that the financial burden of ED care for asthma may take a severe toll on low-income populations who have limited ability to pay, especially patients who must pay undiscounted charges, including the uninsured and those on high-deductible health plans.

Keywords

Asthma; fees and charges; health services research; delivery of health care

In 2011, an estimated 25.9 million Americans had asthma, including almost 10% of American children.^{1,2} Asthma costs the United States \$56 billion annually, and specifically accounts for \$50.1 billion in direct health care costs.³ This includes the costs of the estimated 1.8 million asthma-related visits that occur in U.S. emergency departments (EDs) every year, amounting to approximately nine visits for every 100 Americans with asthma.^{4,5}

Emergency department visits for asthma are disproportionately common among minorities, those of lower socioeconomic status, and the uninsured.^{5–10} The costs of an ED visit can be devastating to these patients, who already face financial and social hardships that limit their access to care and ability to pay. For instance, the 16% of Americans who are uninsured often wait for symptoms to deteriorate due to financial barriers to care, and eventually must seek urgent care in the ED.¹¹ In fact, visits to the ED accounted for 39% of all healthcare visits for asthma among uninsured patients, compared with 14% for the privately insured

and those insured by Medicaid.¹² In addition, low-income Medicaid patients disproportionately seek care in the ED,¹³ and increasingly could face unaffordable and burdensome co-pays and cost sharing as part of their care.^{14–16}

Previous work by our team has explored charges for the top ten ED diagnoses among non-elderly adults, but has not addressed charges for asthma.¹⁷ Due to the disproportionate healthcare use for asthma by low-income patients,⁵ who are often uninsured and have limited ability to pay, we felt that charges for ED treatment of asthma were particularly relevant for patients and policy makers. In addition, though asthma patients are significantly more likely to receive outpatient care in the ED than be admitted to the hospital,^{12,18} past studies of the cost burden of hospital visits for asthma patients have focused on inpatient care.^{19–22} As emergency department charges rise,²³ and patients are responsible for a greater portion of their health care costs,²⁴ understanding the cost of this ED care for asthma is increasingly important to patients. Further, emergency physicians often struggle to respond to inquiries from patients about the charges of their care²⁵ and should have information available as to an asthma patient's likely charges.

In this study, we sought to assess the financial burden of acute asthma exacerbations by analyzing the charges facing patients who visit the ED as an outpatient for asthma-related complications. Specifically, we attempted to determine whether these charges vary by insurance status, as different charges have unique consequences for these demographics.

Methods

We performed a nationwide, cross-sectional study of outpatient asthma-related ED visits from 2006–2008. Data on visits, charges and insurance status were obtained from the Medical Expenditure Panel Survey (MEPS) conducted by the Agency for Health care Research and Quality. The MEPS is a large-scale national survey that incorporates a Household Component gathered from a sample of patients and households who are representative of the U.S. civilian non-institutionalized population.²⁶ An additional Medical Provider Component consists of data provided by pharmacies and medical providers to supplement and verify information from the household sample.²⁷ Specifically, the Emergency Room Visits portion of the Medical Provider Component collects information on each reported visit, including diagnosis and procedure codes, charges, and payments.

Study design and data sources

To create a database of ED visits, we linked the MEPS Emergency Room Visits data file (patient conditions, charges, expenditures, and payments) with the MEPS Full Year Consolidated data file (patient demographic and insurance information). In accordance with previous studies using MEPS,²⁸ our sample consisted of all outpatient ED visits that had asthma recorded as one of the top three patient conditions (*International Classification of Diseases, 9th Edition* [ICD-9] code 493). We focused on outpatient ED visits so that our data would not be affected by hospitalization expenses or severe comorbidities that would drive up charges. In our stratified analysis, we defined four categories for patient insurance: uninsured, Medicare, Medicaid, and private insurance. The insurance status variables

indicated whether a patient had a particular form of insurance at any time during the year of the ED visit.

This study was exempt from review by the UCSF Institutional Review Board.

Outcome measure

Our primary outcome measure was *total charges*: the dollar amount seen on a patient's hospital bill, to be paid either by the patient or their insurance.

Statistical analysis

Initially, we compared the demographics of our sample including race, income, region, gender, and age between different insurance groups using a chi-square test of independence. We then descriptively analyzed the charges by insurance group, using ANOVA to compare means between the groups. Charges were adjusted to 2008 USD due to substantial changes in the Bureau of Labor Statistics' Consumer Price Index from 2006 to 2008.²⁸ For population-level estimates, the data were weighted according to the appropriate sampling weights for the 2006–2008 MEPS surveys.³⁰

We further stratified these insurance-specific charges by age group (0–19 years, 20–44 years, 45–64 years, and 65 years or older) as is commonly done in the literature on medical charges and spending^{31,32} in order to provide estimates with less variability due to comorbidities, severity, and clinical outcomes.^{26,27} Finally, we ran a linear regression model using log-transformed charges as our dependent variable to control for charge's rightward skew. We regressed age on these charges and used fixed effects for insurance to calculate predicted prices for each insurance type at different ages. We further controlled for region, patient income, race, and gender.

Results

The final weighted sample consisted of 2.9 million asthma-related ED visits from 2006–2008. As shown in Table 1, the majority of the sample was non-white (77%) and low income (< 200% of the federal poverty line [FPL]) (56%). Twenty percent of patients had no insurance, Medicaid covered 39%, 19% had Medicare, and 46% were privately insured. Low-income patients (< 200% FPL) comprised 69% of those with no insurance, 87% of Medicaid patients, 66% of Medicare patients, and 24% of the privately insured.

The charges incurred for asthma-related ED visits ranged from \$19 to \$12,601, averaging \$1,502 per visit (95% CI 1493–1511). Table 2 shows charges by age and insurance status. Medicare patients had the highest mean charge at \$2,211 per visit (95% CI: \$1619–\$2803), followed by the privately insured (\$1,767; 95% CI: \$1478–\$2055). Uninsured (\$1,463; 95% CI: \$1075–\$1851) and Medicaid patients (\$1,450; 95% CI: \$1221–\$1678) had lower charges. Upon analysis of the stratified charges using ANOVA, we could not reject the possibility that all of the insurance group means were the same.

Our linear model indicated that predicted charges for outpatient asthma-related ED visits increased significantly with age across all insurance groups, as shown in Figure 1.

Discussion

Our results indicate that in the United States, patients will be charged an average of \$1,502 for an outpatient ED visit for asthma. The variability is large, however, as charges can range from \$19 to \$12,601. These costs of visiting the ED can also be multiplicative, as visits are common among patients with chronic asthma.³³ These charges pose a significant hardship to asthma patients who are uninsured or who have high deductible health plans, as they are responsible for all or most of this charge each time they visit. These groups encompass an increasing portion of patients, because though the number of uninsured Americans has leveled at 16%,³⁴ the proportion of people with employer-sponsored insurance plans with deductibles over \$1,000 for single coverage (\$2,000 for family coverage) has increased from 4% in 2006 to 19% in 2012.²⁴ Past literature has shown that high-deductible plans can result in significant financial burden for families with members who have chronic diseases such as asthma.^{35–37}

Further, the low-income patients in our sample constituted 69% of the uninsured and 24% of the privately insured. These patients likely represent the working poor, who face significant responsibility for payments for asthma care, but a limited ability to pay those fees. For instance, a \$1,502 charge for a single person at 200% of the FPL would represent 7% of their annual income in 2008.³⁸ This is of particular concern because asthma disproportionately affects low-income populations.⁷ In fact, low-income families and those who are on high-deductible plans have been shown to forego or delay care because of cost and to feel as if they had little control over costs in clinical encounters.^{39,40} The burden of these charges can be mitigated by hospitals' charity care provided to very low income patients without insurance.^{41,42} However, this practice is limited to the poorest patients and cannot be guaranteed upon arrival.⁴² Even if patients end up paying only a portion of their charges, the financial repercussions on middle or lower-income families are often still severe.

The variability in possible charges poses additional challenges to any patient attempting to control their health care costs for asthma. Not knowing and not being able to determine cost of care for an episode of asthma can discourage care-seeking and burden those who come to the ED with an urgent asthma exacerbation and thus do not have the ability to spend time determining the lowest-cost location.^{40,43} Though this variability makes it hard for physicians to estimate a patient's charges for asthma upon inquiry, knowledge of this variability can be shared with patients to prepare them for the large range in possible bills they could face.

Consistent with previous studies, our results indicated an increase in ED charges with increasing age.^{5,44} This was expected due to age-associated comorbidities such as chronic obstructive pulmonary disease that are likely to complicate disease management and thus increase charges.^{45,46} Interestingly, charges did not vary significantly by insurance coverage. This trend may be a consequence of hospital charge masters, which provide common charges for billing of all patients. These charge masters often list inflated prices in anticipation of negotiated discounts with insurance companies.^{47,48} Even if Medicare, which had the highest mean charge of the insurance groups, however, did have a statistically

significant higher charge, it would not be surprising given that Medicare patients are older and, on the whole, sicker than patients in other insurance groups and may require more intensive care, even if discharged.

Limitations

This study had several limitations associated with the nature of the MEPS survey. First, patient report of whether they were insured under a particular plan at any point during the year served as a crude measure of insurance status at the time of the ED visit. It is plausible that a patient who reported being uninsured was in fact insured during the asthma-related ED visit. However cross-classification by insurance status and payment source in our analysis indicated few discrepancies between the two variables. For example, one would expect patients insured by Medicare and Medicaid to have very few out-of-pocket payments if they were in fact insured by Medicare and Medicaid for most of the year. Our data did in fact show that these patients had few out-of-pocket payments, suggesting that the health insurance variable in the MEPS survey often corresponded to insurance status at the time of visit.

Second, the data from MEPS used in this study largely rely on direct survey of patients, which may be inaccurate. However, these limitations are addressed in part by the Medical Provider Component, which validates household reporting of medical use and expenditures. Furthermore, we think the use of MEPS is still suitable in our analysis due to its utilization in previous studies that considered variables similar to those used in this study in order to analyze trends in asthma^{28,49} and other conditions.^{50,51}

Another potential limitation is that patients who have respiratory conditions other than asthma may have more complications or require more treatment in the ED and as a result, incur higher charges. We address this concern by limiting our analysis to visits that were discharged from the ED so that visits with severe comorbidities leading to hospitalization are not included in the analysis. Furthermore, we conducted analyses by age group, which is closely associated with comorbidities. Charge variations among patients of different insurance status even within age groups suggested that disparities in charges extend beyond more expensive management for patients with comorbidities.

Conclusions

On average, a patient visiting the ED as an outpatient will be charged \$1,502 for treatment of asthma, though recorded charges varied from \$19 to \$12,601. Uninsured patients and those on high-deductible private health plans are especially affected by these charges, and low-income patients who are disproportionately affected by asthma face significant challenges to paying such an ED bill. Further research is warranted on the sources of variability in ED charges for asthma patients and their impact on the finances and health of patients with asthma.

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Figure 1.
Predicted Charge by Age and Insurance

Table 1

Characteristics of outpatient ED visits for asthma**

	All		Uninsured		Medicaid		Medicare		Private Insurance	
	N	%	N	%	N	%	N	%	N	%
Race/Ethnicity*										
White, Non-Hispanic	1,174,036	39%	169,559	30%	250,040	23%	200,194	56%	659,696	51%
African American, Non-Hispanic	1,085,486	36%	281,220	50%	475,591	44%	105,052	29%	349,182	27%
Hispanic	532,283	18%	88,208	16%	257,106	24%	24,299	7%	199,817	16%
Asian	63,071	2%	7,060	1%	50,767	5%	27,510	8%	5,245	0%
Geographic Region										
Northeast	654,304	22%	165,904	30%	173,233	16%	106,169	30%	295,860	23%
Midwest	634,620	21%	69,479	12%	299,862	28%	61,010	17%	272,257	21%
South	1,199,636	40%	257,642	46%	393,217	36%	135,251	38%	504,067	39%
West	476,818	16%	68,822	12%	218,859	20%	54,626	15%	209,996	16%
Income*										
Poor (less than 100% FPL)	894,473	30%	287,985	51%	485,552	45%	127,502	36%	148,187	12%
Near poor (100% to <125% FPL)	172,467	6%	29,577	5%	113,822	10%	36,168	10%	22,652	2%
Low income (125% to <200% FPL)	610,101	20%	68,477	12%	339,903	31%	70,987	20%	133,347	10%
Middle income (200% to <400% FPL)	761,401	26%	110,653	20%	136,482	13%	34,694	10%	568,846	44%
High income (>400% FPL)	541,690	18%	65,156	12%	9,412	1%	87,705	25%	409,147	32%
Age*										
0-4	595,053	20%	75,752	13%	312,698	29%	3,012	1%	188,503	15%
5-19	826,300	28%	93,774	17%	401,191	37%	4,031	1%	382,225	30%
20-44	625,053	21%	288,732	51%	156,157	14%	35,778	10%	229,127	18%
45-64	660,228	22%	103,589	18%	152,461	14%	55,490	16%	361,652	28%
65-85	258,745	9%	-	0%	62,663	6%	258,745	72%	120,673	9%
Sex*										
Male	1,389,994	47%	305,239	54%	489,205	45%	13,665	4%	561,946	44%
Female	1,590,137	53%	256,609	46%	595,967	55%	343,391	96%	720,234	56%
TOTAL	2,980,132	100%	561,847	100%	1,085,171	100%	357,056	100%	1,282,180	100%

* Pearson chi-squared test $p < 0.05$

** Note the insurance-specific samples may sum to more than the total sample, as insurance categories are not mutually exclusive.

Table 2

Charges for episodes of outpatient asthma care in the ED, by payer

Age group	Uninsured Mean (95% CI)	Medicaid Mean (95% CI)	Medicare Mean (95% CI)	Private Mean (95% CI)
0–19 years	\$1,120 (720,1700)	\$1,108 (892,1324)	\$414 (409,420)	\$1,263 (963,1563)
20–44 years	\$1,259 (820,1698)	\$1,911 (1108,2715)	\$1,234 (908,1561)	\$2,052 (1500,2604)
45–64 years	\$2,511 (994,4028)	\$2,160 (1436,2885)	\$2,120 (1124,3117)	\$2,001 (1416,2585)
65+ years	NA	\$2,484 (1243,3724)	\$2,512 (1689,3336)	\$3,423 (1579,5267)
All	\$1,463 (1075,1851)	\$1,450 (1221,1678)	\$2,211 (1619,2803)	\$1,767 (1478,2055)