

Freestanding Emergency Departments Are Associated With Higher Medicare Costs: A Longitudinal Panel Data Analysis

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Abstract

The number of freestanding emergency departments (FSEDs) is growing rapidly in the United States. Proponents of FSEDs cite potential benefits of FSEDs including lower waiting time and reduced travel distance for needed emergency care. Others have suggested that increased access to emergency care may lead to an increase in the use of emergency departments for lower acuity patients, resulting in higher overall health care expenditures. We examined the relationship between the number of FSEDs in each county and total Medicare expenditures between 2003 and 2009. Our results show that each additional FSED in a county is associated with an expenditure increase of \$55 per Medicare beneficiary. This finding suggests that even if FSEDs may increase access to emergency care, it may result in higher overall Medicare expenditures.

Keywords

freestanding emergency departments, hospital emergency services, emergency medical services, Medicare, health expenditure, health services accessibility, longitudinal studies

Introduction

Freestanding emergency departments (FSEDs) are health care facilities providing emergency services, but not located on hospital campuses.¹ Starting in 2004, Medicare began allowing payment for the services provided in FSEDs.² Changes in Medicare reimbursement policy and increases in demand for emergency care may have contributed to the growth of FSEDs.^{2–4} As of 2015, there were 400 FSEDs compared with 4147 traditional hospital-based emergency departments (EDs).⁵ While FSEDs are growing fast, their growth is concentrated in certain geographical locations where they may have substantial impact on health care cost and delivery.

These facilities can provide services nearer to patients' homes and usually have much lower waiting times compared with traditional hospital EDs. Proponents of FSEDs assert that these facilities may improve access to emergency care by reducing the burden of overcrowding in traditional EDs. FSEDs may also decrease health care costs by providing care at a lower reimbursement level compared with traditional EDs. However, previous studies on emergency care access and expenditure indicate that the higher access may lead to higher utilization of health care services, which may lead to an increase in overall health care costs.^{6,7} Based on these findings, it is possible that FSEDs may increase health care

expenditures due to increased utilization of emergency care for lower acuity medical conditions.

To date, there has been no study examining how FSEDs may affect Medicare costs. Medicare patients comprised 18% of ED visits in the year 2011.⁸ This study examines the relationship between the presence of FSEDs in the market and changes in Medicare costs. Findings from this study can inform policy makers in formulating policies on the reimbursement to and utilization of FSEDs.

Emergency Care and FSEDs

EDs have a unique role in the health care system, including 24-hour services without a prior appointment. The demand for emergency care services is on a sharp incline. According

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to the National Hospital Ambulatory Medical Care Survey, there was a 32% increase in demand for emergency medicine services from 1999 to 2009.⁹ Some of the reasons that may account for the increase in the demand for emergency care are the higher number of patients seeking acute care in EDs instead of primary care,^{10,11} and an increase in the aging of the population.¹² At the same time, there was a 11% decrease in the number of EDs in the United States between 1995 and 2010.¹³ Therefore, both supply and demand factors may have contributed to ED crowding, as the patient volume is greater than available ED rooms or staff.

Although the Affordable Care Act decreased the number of uninsured by increasing access to private insurance and Medicaid expansion, the demand for ED services may have actually increased. An experimental study in Oregon found that an expansion in Medicaid coverage leads to an increase in the emergency health care services utilization.¹⁴ Similar results were found in another report comparing hospitals in 13 states with, and 12 states without, Medicaid expansion between 2013 and 2014.¹⁵ There was a 6% increase in the number of ED visits in states with Medicaid expansion compared with 2% increase in states without Medicaid expansion.¹⁵ Similarly, recent survey results from the American College of Emergency Physicians indicated that 74% of emergency physicians observed an increase in the ED visits since the roll-out of the Affordable Care Act, while 86% anticipated an increase in ED visits over the next 3 years.¹⁶ Therefore, the demand for emergency visits is likely to continue increasing, and FSEDs will see a similar trend. And the use of EDs for lower acuity conditions may lead to an increase in ED utilization and overall costs. Thus, it is important to study the relationship between FSEDs and health care costs.

FSEDs represent an innovative delivery model that may help address some of the gaps between supply and demand in emergency care. According to Sullivan et al,¹ an FSED is defined as a facility that is (1) open to all types of emergencies, (2) not located within a hospital, (3) open to the general public, (4) open daily, and (5) open at least 156 of 168 hours per week including holidays. The 156-hour criterion was meant to allow for occasional facility closure during the middle of the night (eg, between midnight and 5:59 AM on Saturday and Sunday mornings), but the expectation is that the vast majority of FSEDs are open 24/7. While urgent care centers (UCCs) also provide immediate health care services without an appointment, UCCs are not open 24/7. Another major difference between FSEDs and UCCs is that FSEDs perform additional procedures such as defibrillation, intubation, and conscious sedation delivered by health care providers trained in emergency medicine.

There are 2 types of FSEDs based on their ownership. Satellite FSEDs are owned by hospitals and typically refer FSED patients back to the owning hospital for inpatient care. By contrast, autonomous FSEDs are owned by physician groups or independent investors. FSEDs need hospital affiliation to receive Medicare reimbursement under the Outpatient

Prospective Payment System (OPPS).^{2,17} Under the OPPTS, hospital-affiliated FSEDs may receive payment equal to that of hospital-based EDs, which includes a facility fee. The majority of FSEDs (69%) are hospital-owned.¹⁷ However, the distinction between satellite and autonomous FSEDs is fading away as smaller hospitals establish affiliations or networks with autonomous FSEDs.⁵

Regulations for FSEDs vary from state to state. Some states have formal regulations and licensure requirements for FSEDs (eg, Florida, Illinois), other states do not require license to operate an FSED (eg, Texas before August 2013), while still other states require hospital affiliation (eg, Connecticut and Florida).^{2,5} Generally, the purpose of these regulations is to control the quality of care delivered in FSEDs, restrict the number of FSEDs in the region, and establish the reimbursement for FSEDs.¹⁸ Some states require FSEDs to remain open 24 hours per day (eg, Texas, Idaho, Alabama, Delaware), whereas other states do not have any restrictions on the hours open (eg, Connecticut, Rhode Island).⁵ The reason behind the opening requirement is to provide the 24-hour emergency access to the patients in the community, and it is consistent with the Centers for Medicare and Medicaid Services (CMS) guidelines of EDs.¹⁸ Moreover, some states restrict the distance of the FSED within a specified number of miles of hospitals with inpatient beds (eg, Alabama) and that FSEDs should transfer the patient immediately when it is determined that the patient needs inpatient care.¹⁹

FSED proponents assert that these facilities will increase access to emergency care for populations that are currently lacking these services. However, these facilities are usually located in urban and higher income suburban areas.²⁰ Thus, this suggests that hospitals open FSEDs to increase market share by locating these facilities in growing suburbs, at a much lower cost than operating a fully functional hospital. Therefore, FSEDs may only abate demand for emergency care in selected locations.

FSEDs may also increase the demand for emergency care services and, thus, may increase overall health care expenditure. A case study of a health care system showed that opening 2 FSEDs in the service area decreased the patient load in the traditional ED but increased overall visits for emergency care for the health care system.²¹ This phenomenon can be explained by the findings of previous studies that have shown that increased access to emergency care can increase utilization.^{6,7} Also, patients with lower acuity conditions tend to defer traveling to seek emergency care; therefore, operating FSEDs nearer to patient homes may lead to an increase in the utilization of emergency care services for lower acuity conditions.²¹ Besides less travel time, FSEDs also tend to offer lower waiting times and better waiting areas compared with traditional EDs. Patients with lower emergency conditions may have to wait longer in traditional EDs as triaging leads to waiting time based on patient's acuity level. As such, patients may utilize FSEDs for avoidable nonurgent conditions where the waiting time is less.²²

Table 1. Description and Data Source of the Variables Used in the Study.

Variables	Measurement	Data source
Dependent variable		
Average annual Medicare expenditure per person	Total annual Medicare cost per person adjusted for price, age, sex, and race. Inflation adjusted for 2009 US dollars	Dartmouth Atlas
Independent variable		
Number of FSEDs in the market	Total number of FSEDs present in a county	Survey
Control variables		
Market competition	HHI = Sum of squared market share of hospitals in county Market share = (Total inpatient days for hospital) / (Total inpatient days in county) Monopolistic market: HHI = 1 Competitive market: $0 < \text{HHI} < 1$ No hospital in the county = -999	AHA
Per capita income (per \$1000)	Average personal income of the residents in the county (per \$1000)	ARF
Primary care physicians (per 100 000 population)	Total number of nonfederal primary care physicians divided by the resident population in given area	ARF
Medicare managed care penetration rate	The ratio of Medicare Advantage Plan enrollees over eligible Medicare individuals multiplied by 100	ARF
Unemployment rate	(Number Unemployed / Civilian Labor Force) * 100	ARF
Total hospital beds (per 100 000 population)	Sum of hospital beds in county (per 100 000 population) = Total hospitals beds in county × 100 000 / Total population in county	AHA
Percent of system-affiliated hospitals	Percent of system-affiliated hospitals in county	AHA
Percent of not-for-profit hospitals	Percent of not-for-profit hospitals in county	AHA
Percent of nonfederal government hospitals	Percent of nonfederal government hospitals in county	AHA

Note. FSED = freestanding emergency department; HHI = Herfindahl-Hirschman index; AHA = American Hospital Association; ARF = Area Resource File.

Medicare patients utilized approximately 18% of all ED visits in 2011, and the average Medicare payment for ED services was \$260 in 2014.^{8,23} As such, an increase in the use of FSEDs for nonemergent services may lead to an increase in Medicare costs. A previous exploratory study found that nonemergent conditions treated in EDs led to an increase in health care cost because of higher charges for nonemergent services in EDs compared with health care settings outside the ED.²⁴ Indeed, FSEDs attract a higher percentage of nonemergent patients.² Therefore, given the potential increase in use of nonemergency services, we hypothesize that the presence of FSEDs in a market will be associated with higher Medicare expenditures.

Method

Data

Data consisted of an inventory of FSEDs from 2003 to 2009 and several secondary datasets (described below). Data were limited to 2003 to 2009 to match the data available from the Dartmouth Atlas on Medicare expenditures by county, as the reporting method for Medicare expenditures changed in 2010. The unit of analysis was at the county level with 3134 counties in 50 states and Washington, DC.

We collected data on FSEDs by telephone interviews of both hospitals and FSEDs²⁵. The FSEDs identified in a

previous study (from the National Emergency Department Inventory database) were contacted for this current survey.¹ Also, those hospitals who responded “yes” to the question of their ownership of FSED in the American Hospital Association (AHA) Annual Survey were contacted for this same survey. We also included the UCCs that are open 24/7 hours and comply with the FSED definition for this study. The response rate for our national survey of FSEDs was 72%. In addition, data for 67 nonrespondent FSEDs were obtained through online searches. The combination of survey and online search data captured 95% of the FSED population.

FSED data were merged with county-level data from secondary datasets. The Dartmouth Atlas was used to calculate Medicare expenditure by county.²⁶ Market competition and other county-level organizational factors were calculated from the AHA Annual Survey data.³ Market factors related to per capita income, unemployment rate, Medicare managed care penetration, and physician supply in the county were obtained from the Area Resource File (ARF).²⁷ There were 128 FSEDs identified from 2003 to 2009.

Variables

The list of variables and their data sources are presented in Table 1. Our key outcome variable was the average Medicare expenditure per beneficiary as a measure of cost at the county

level. The Dartmouth Atlas reports average Medicare expenditure per beneficiary for all services (inpatient and outpatient), calculated from the comprehensive claims file from CMS. These data consist of a 20% sample of fee-for-service Medicare beneficiaries (excludes all patients enrolled in health maintenance organizations) and contain annual reimbursements for their Medicare Parts A and B. Total Medicare expenditure per beneficiaries is adjusted for price, age, sex, and race in the Dartmouth Atlas. Price adjustment accounts for the regional variation in reimbursement rates. Finally, the average Medicare expenditure per person is adjusted for inflation using the consumer price index.²⁸

The number of FSEDs in the county in a given year as identified by our survey was the independent variable. In addition, the study controlled for market (county) variables that may affect the efficiency and cost of health care services. For example, higher hospital market competition may lead hospitals to use more high-tech services, which may increase Medicare costs.²⁹ We used AHA data to calculate the Herfindahl-Hirschman index (HHI) as a measure of hospital competition in the county. The HHI is the sum of the square of hospital market shares in the county. Based on the HHI, we divided the market into 3 categories: (1) monopolistic markets—HHI equal to 1 (only 1 hospital in a county), (2) competitive markets—counties with more than 1 hospital or HHI less than 1, and (3) no hospitals in the county.

An increase in the number of primary care physicians in an area may lead to lower demand for emergency health care services, and ultimately lead to decreases in health care cost.^{11,30} Therefore, we controlled for primary care physicians per capita in the model. Other control variables included per capita income, Medicare managed care penetration rate, unemployment rate, total hospital beds in the county, percentage of system member hospitals in the county, and percentage of not-for-profit and nonfederal government hospitals in the county.

Analysis

We used longitudinal panel data to evaluate the effect of an increase in the number of FSEDs at the county level on average Medicare expenditure per beneficiary. We used a multivariate regression model with county and year fixed effects and standard errors corrected for clustering at the county level. County fixed effects control for time-invariant unobserved factors that may affect Medicare expenditure at the county level, whereas year fixed effects control for time trends. Sensitivity analyses were conducted with a 1-year lag for the independent variable (number of FSEDs). Given similar results, we report the nonlagged results.

Results

Figure 1 shows the growth of autonomous and satellite FSEDs, and the total number of counties with FSEDs during the 7-year

study period. While there were 45 FSEDs in 37 counties in 2003, the number increased to 128 FSEDs in 84 counties by 2009. Table 2 provides descriptive statistics for all counties in the United States for baseline (year 2003) and final period of study (year 2009). The average Medicare expenditure per beneficiary (inflation adjusted) increased by 20.6% during the study period. The number of counties with FSEDs increased from 1.2% in 2003 to 2.7% in 2009. Medicare managed care penetration rate also increased threefold and the unemployment rate increased by 45% from 2003 to 2009.

Table 3 shows the results of the multivariate fixed effects regression. The regression results show that an increase in the number of FSEDs in the market is positively and significantly related to average Medicare expenditure per person. The average Medicare expenditure per beneficiary is \$55 higher for every additional FSED operating in a county. This represents an increase of approximately 0.7% in Medicare expenditure per beneficiary relative to the average Medicare expenditure per beneficiary of \$8360 during the study period (2003-2009). Although this is a relatively small change on a per capita basis, it can be significant on a county basis considering that FSEDs have been primarily limited to urban and more populated counties.

We did not find any significant differences in Medicare expenditures between monopolistic and competitive markets. However, counties with no hospitals had lower Medicare expenditure per person than counties with hospitals. An increase in the percent of not-for-profit hospitals and in nonfederal government hospitals in the county was associated with decreased Medicare expenditures, compared with an increase in the percentage of for-profit hospitals. All other variables were not significantly associated with the average annual Medicare expenditure.

Discussion

The rapid recent growth in FSEDs, in several geographic areas across the United States, may have been a response to the increasing demand for ED services along with a strategy to expand geographically to attract more affluent and better insured populations.^{2,31} In this article, we explored the relationship between an increase in the number of FSEDs and average Medicare expenditure per beneficiary at the county level. Previous studies have found that an increase in access and proximity to emergency care leads to an increase in the utilization of emergency care.^{6,7} As such, the presence of FSEDs in the county may lead to an increase in the utilization of emergency care. Furthermore, FSEDs may attract more nonemergent and nonurgent patients compared with traditional EDs. Together, these factors may lead to further increases in Medicare expenditure. Consistent with our hypothesis, the study results suggest that an increase in the number of the FSEDs in a county is associated with a higher total Medicare expenditure per beneficiary.

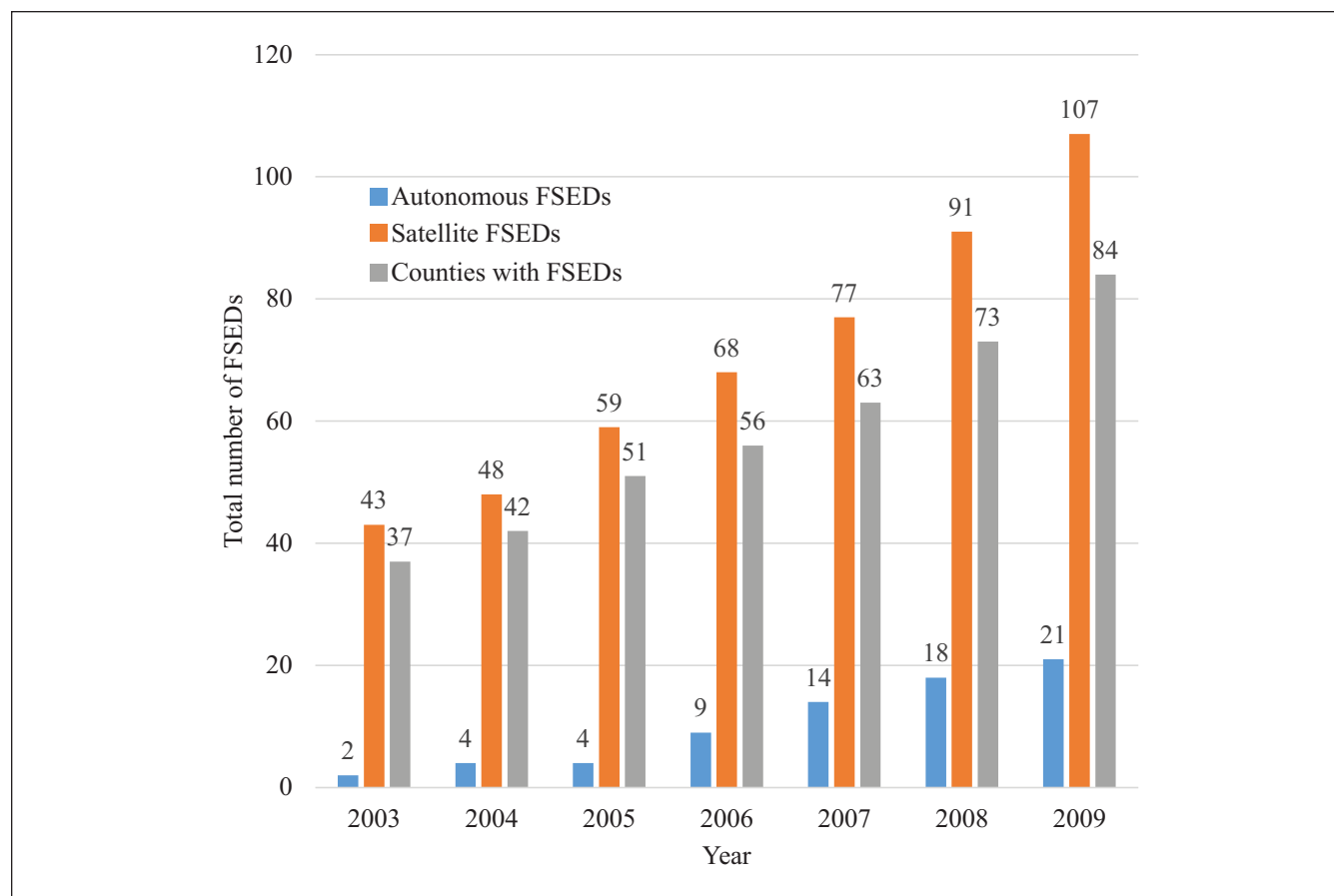


Figure 1. Growth of FSEDs in the United States between 2003 and 2009.

Note. FSED = freestanding emergency department.

Table 2. Comparing Average Annual Medicare Expenditure Per Person, Percentage of Counties With FSEDs, and County Level Factors That Affect Medicare Expenditure in 2003 and 2009.

Variable	Year 2003			Year 2009		
	n	Mean or %	SD	n	Mean or %	SD
Average annual Medicare expenditure per person	3130	7565	1471	3126	9121	1886
% counties with FSEDs	3130	1.18%		3135	2.68%	
Market competition						
Monopolistic market (reference)	1659	53.00%		1676	53.46%	
Competitive market	804	25.69%		816	26.03%	
No hospital in the county	667	21.31%		643	21%	
Per capita income (per \$1000)	3130	24.73	6.24	3135	33.01	8.60
Primary care physicians (per 100 000 population)	3130	28.12	20.60	3135	26.82	20.69
Medicare managed care penetration rate	3130	3.56	7.85	3135	15.3	11.19
Unemployment rate	3130	6.19	2.78	3135	8.99	3.22
Total hospital beds (per 100 000 population)	3130	2.42	7.36	3135	2.45	7.76
Percent of system-affiliated hospitals	3130	38.14	45.18	3135	42.39	46.53
Percent of not-for-profit hospitals	3130	44.55	47.28	3135	44.39	47.21
Percent of nonfederal government hospitals	3130	25.44	41.77	3135	24.71	41.30

Note. Average annual Medicare expenditure is inflation adjusted for 2009 US dollars. FSED = freestanding emergency department; n = number of counties.

Table 3. Effect of the Presence of FSEDs on Medicare Expenditure, 2003-2009.

Variables	Average annual Medicare expenditure per person
	Coefficient
Number of FSEDs in the market	55.16*
Market competition	
Monopolistic market (reference)	
Competitive market	100.23
No hospital in the county	-489.81**
Per capita income (per \$1000)	-9.22
Primary care physicians (per 100 000 population)	-1.17
Medicare managed care penetration rate	3.63
Unemployment rate	4.98
Total hospital beds (per 100 000 population)	-0.08
Percent of system-affiliated hospital	0.61
Percent of for-profit hospitals (reference)	
Percent of not-for-profit hospitals	-1.76*
Percent of nonfederal government hospitals	-2.69*

Note. Total Medicare expenditure per person is in the US dollars adjusted for inflation for year 2009. Average annual Medicare expenditure is inflation adjusted for 2009 US dollars. FSED = freestanding emergency department; n = number of counties.

* $p < .05$. ** $p < .01$.

Given this positive association between number of FSEDs and Medicare expenditure, policy makers and third-party payers may want to consider changes in the reimbursement of FSEDs. Currently, Medicare reimburses satellite FSEDs similar to hospital-based EDs, paying physician fees under Medicare Part B as well as a facility fee. FSED reimbursement could be changed to account for patient acuity, with lower reimbursement facility fees for lower acuity conditions. This may incentivize the colocation of FSEDs with UCCs to provide coordinated care and facilitate the triage of patients, so that lower acuity patients can be treated at UCCs, while patients needing emergency care would be treated at FSEDs.

Despite the potential impact of FSEDs on Medicare expenditure, it remains possible that these entities may reduce crowding in traditional EDs by diverting patients with lower acuity conditions away from traditional EDs. If true, this would result in more timely access to emergency care. This is particularly important given the increasing demand for emergency care services in recent years. On the other hand, FSEDs tend to be located in more affluent suburban areas and, as a result, may not necessarily meet the need for emergency care from underserved communities, such as lower income inner-city neighborhoods or rural areas. Further research is needed to formally examine how FSEDs affect the demand for traditional EDs and access to emergency care in underserved populations.

Our study also shows that the presence of a hospital in the county has higher average Medicare expenditure compared with counties with no hospital. This finding is consistent with previous studies, which found that an increase in access

leads to higher utilization of health care services.^{6,7} Also, an increase in the percentage of not-for-profit hospitals compared with for-profit hospitals is associated with lower Medicare expenditure in the county. A possible explanation for the latter finding is that for-profit hospitals tend to provide profit-making services as compared with not-for-profit hospitals and nonfederal government hospitals, which may increase the costlier services provided to Medicare patients. For example, a previous study found that for-profit hospitals provided more profitable services like open heart surgery compared with not-for-profit hospitals and government hospitals.³² Furthermore, for-profit hospitals were less likely to provide non-profit-making services such as psychiatric emergency services compared with not-for-profit and government hospitals.

As a supplement to the current payment system, lawmakers might consider policies that encourage lower cost primary care access.³³ Retail health centers, either stand-alone or linked to pharmacies, offer potential access routes that appear more economical and, at least for some conditions (eg, vaccinations), may be more effective. Currently, FSED reimbursement is substantially higher than for primary care outlets, thus encouraging the ongoing development of FSEDs. Changing reimbursement for primary care services offered after hours may help the overall cost effectiveness of the US health care system.

As Accountable Care Organizations develop and expand, FSEDs may also be threatened.³⁴ When reimbursement is capitated, access to care may shift to the lowest cost outlets, which may be primary care clinics or derivations of standard primary care facilities. More sophisticated and complex diagnostic services that tend to be costly, such as FSEDs, may only be justified in very high density market areas.

Limitations

There are a few potential limitations with this study. First, the variables are measured at the county level. Patients living on the border of 2 or more counties may utilize the ED services located in the other counties. Second, this study is focused on the impact of FSEDs on Medicare expenditure. Medicare beneficiaries usually have better access to primary care³⁵; therefore, it is possible that the supply of FSEDs may result in even higher health care expenditure among non-Medicare patients as compared with Medicare patients. Further research is needed to examine the implications of FSEDs on health care expenditure among privately insured patients. Third, although we observe an increase in Medicare expenditures associated with an increase in the number of FSEDs in a county, due to data limitations we are not able to assess whether the increase in expenditure is a direct result of increased ED visits to FSEDs. The fixed effects models account for potential omitted variable bias that results from time-invariant confounders. We note that a sensitivity analysis with a lagged independent variable yields similar results. However, there may be other

sources of endogeneity—including time-variant omitted variables, as well as some possibility of bidirectionality (even though the results from the lagged independent variable mitigate that concern to some extent). Future research is needed to explore how the supply of FSEDs affects utilization for hospital-based EDs and FSEDs. Fourth, there may be benefits to Medicare beneficiaries that are not captured in this study, such as improved patient experience. Finally, our study is limited to 2003-2009 data. FSEDs are growing entities in the health care system in the United States. A follow-up study examining the impact of FSEDs on overall health care cost should be pursued as FSEDs become more established health care entities in the United States.

Conclusion

In summary, FSEDs are associated with an increase in Medicare expenditure. Emergency care outside the traditional ED may increase access to both emergency and urgent health care, and this may be associated with higher health care cost. Policy makers and third-party payers may want to consider changes in reimbursement to these facilities to account for acuity of patients.

FSEDs receive a higher number of patients with lower acuity as compared with regular hospital-based EDs. FSEDs also charge for the facility fee, and this may lead to an increase in health care costs. Therefore, policy makers should consider reforming the current payments system to FSEDs based on the acuity level of patient conditions. This will also incentivize FSEDs to adopt innovative models like the colocation of primary or urgent care facilities within FSEDs. The patients could be triaged before treatment at FSEDs, and patients with lower acuity could be treated in a primary or urgent care settings. Further research is needed to examine the impact of FSEDs on demand for traditional EDs and on access to emergency care for underserved populations.

Declaration of Conflicting Interests

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