Do Freestanding Emergency Departments in Texas Alleviate Congestion in Hospital-based Emergency Departments?

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**Abstract:**

**Objectives**: Ever since the passage of the Texas Freestanding Emergency Medical Care Facility Licensing Act in 2009, freestanding Emergency Departments (EDs) have flourished in Texas. This study aims to answer the question whether the entry of freestanding EDs alleviated congestion in nearby hospital-based EDs.

**Methods**: I used hospital-based ED annual visit volume, median wait time, length of visit for discharged patients and drop-out rate as the dependent variables of interests. My main explanatory variables were the numbers of freestanding EDs within the same markets of hospital-based EDs, and a dummy variable for whether the hospital owned satellite EDs in outlying areas. I used generalized linear models to investigate the impacts.

**Results**: My results revealed that hospital ED visits, wait times, length of visit for discharged patients, and drop-out rates were not influenced by the entry of freestanding EDs, neither independent freestanding EDs nor hospital satellite EDs. Setting up hospital-affiliated satellite EDs significantly increased the overall ED visits, but did not help with the wait times, length of visit or drop-out rates in their main hospital-based EDs.

**Conclusions**: The entry of freestanding EDs didn’t help relieve congestion in nearby hospitals. By offering more choices, they expanded the market and increased the usage of emergency services. As a result, the existing policy, instead of relieving the hospital burden, stimulated the demand for emergency services and increased healthcare spending.

**Introduction:**

The past decade has witnessed a growing trend in using emergency care. Based on the 2015 National Hospital Ambulatory Medical Care Survey[[1]](#footnote-1), the number of Emergency Department (ED) visits reached 136.9 million nationally, with an average of 0.43 visit per person annually. Texas, as the second most populous US state, had nearly 12 million ED visits in 2016 with an annual increase rate over 2%[[2]](#footnote-2). It is often argued that the sharp rise in ED visits limits access to timely emergency care.

In an effort to relieve hospital emergency congestion and help patients access care in emergency service shortage areas, freestanding EDs were introduced in many states in the U.S. Delivering emergency care service is not necessary to be happened in the traditional hospital-based EDs. Freestanding EDs, which are structurally separate and distinct from hospitals, flourished in urban communities and changed the emergency service markets.

Two types of freestanding EDs in Texas, independent freestanding EDs and hospital-affiliated satellite EDs, can be found in Texas. Independent freestanding EDs became available in 2009 under the Texas Freestanding Emergency Medical Care Facility Licensing Act by the 81st Legislature[[3]](#footnote-3). Those independent freestanding EDs are not required to function under a hospital’s license and can be operated by private parties. The hospital-affiliated satellite EDs are owned and operated by their parent hospitals or hospital systems. Different from independent freestanding EDs, satellite EDs receive Medicare and Medicaid reimbursement from government and get paid by private insurance under the name of their parent hospitals. Both types of freestanding EDs thrive in the loose regulatory environment in Texas. By the end of 2016, over 300 freestanding EDs were found in the state, and about two thirds were independent freestanding EDs, which were private-owned and for-profit facilities.

**Importance**

The proliferation of freestanding EDs has provided both opportunities and challenges for healthcare providers, legislators, and payers. Much has been debated about the new policy. It is true that freestanding EDs provide time-effectively emergency care without long wait times in hospitals. For those patients with low-acuity suffering from long wait times in hospitals, no wait time in freestanding EDs is attractive. However, critics argue that the facilities increased overall healthcare spending, by serving as supplements rather than substitutes to traditional emergency rooms. Offering more choices in the healthcare market are likely to increase the utilization and spending[[4]](#footnote-4). By locating in wealthy communities[[5]](#footnote-5)[[6]](#footnote-6), freestanding EDs delivered emergency care in a high cost setting, which was 10 times higher than urgent care centers under the same diagnosis[[7]](#footnote-7). Those bills were at similar rates to full-service hospital EDs charge, even though they often provided less resource‐intensive care. Another research also suggested patients in freestanding EDs had fewer comorbidities, shorter length of stay and lower hospital admission rates[[8]](#footnote-8). Therefore, both the 2017 and 2018 MedPAC reports to the congress[[9]](#footnote-9) suggested reducing Medicare payment rates for those visits in satellite EDs in urban areas. The revolution in the Medicare payment might also trigger the changes in private part. Blue Cross Blue Shield, one of the biggest insurers in Texas, even made controversial announcement that they would not pay for non-emergency ER visits in early 2018[[10]](#footnote-10).

Though many physicians and policy makers declaimed that freestanding EDs would reduce patient volume at hospitals, the literature contains only limited quantitative studies towards the impact of freestanding EDs on access to emergency care. Different from California and many other states with restrict state regulations towards freestanding EDs[[11]](#footnote-11), Texas has relative loose policy and a range of cities in different sizes. As the second populous state with more than 300 freestanding EDs in the state, Texas would be a good example to study the phenomenon of emergency market competition by introducing freestanding EDs.

**Overall work**

This work aims to argue whether freestanding EDs in the emergency market help relieve burden of hospital-based EDs. My hypothesis is the entry of freestanding EDs decreased the ED visits, wait times, length of visit for discharged patients and drop-out rates in nearby hospital EDs. The entry was defined in two aspects, one was the number of freestanding EDs nearby, and another one was whether the hospital built its own satellite EDs. I examined all hospitals in Texas and showed the impact of new establishments of freestanding EDs on hospital-based EDs. For direct comparison of hospital performance before and after, I identified volume of visits, wait times, length of visit for discharged patients and drop-out rates as the most important determinates to measure congestions in hospital-based EDs during 2010 to 2016.

**Methods:   
Study design, setting and population**

The goal of this work is to investigate whether the entry of freestanding EDs helped relieve ED congestions in nearby hospitals and improve hospital emergency service efficiency. This study was approved by the Institutional Review Board (IRB) at Rice University.

There are two types of freestanding ED facilities: Independent freestanding EDs and hospital-affiliated satellite EDs. Locations and entry/exit dates for independent freestanding EDs and hospital-based EDs were acquired online from the Texas Department of State Health Services for facilities. Locations for hospital satellite EDs were recorded by visiting the website for each hospital with satellite ED(s) and contacted by e-mail or phone to obtain their opening dates. This search process identified 325 independent freestanding EDs and 121 hospital satellite EDs between 2010 and 2016.

Hospital-based ED annual visit volumes were obtained from the American Hospital Association’s Annual Survey from 2010 to 2016. For hospitals owned satellite EDs, annual visits also included visits to affiliated satellite EDs. I excluded military/behavioral hospitals in the sample. A total of 370 hospitals remained open during my target period.

Hospital ED efficiencies were defined as emergency room wait time, length of visit for discharged patients and drop-out rate in main hospital-based ED. The measurements were obtained from the Centers for Medicare and Medicaid Service (CMS) “Hospital Compare Timely and Effective Care Survey” from 2012 (the earliest year available) to 2016. The **Wait Time** was the median time from door to diagnostic evaluation by a qualified medical professional. Length of visit for discharged patients (short for “**Discharge Time**” thereafter) measured the time from ED arrival to ED departure for discharged patients. ED annual **Drop-out Rate** was percentage of patients left without being seen.

Public Use Microdata Area (PUMA)-level data on population; average household income; percentages of residents with Medicaid, Medicare, private, or any type of insurance; percentage of residents who were Hispanic or Black; and percentage of residents with age above 65 were obtained from the 2010 to 2016 American Community Surveys.

**Data Analysis**

I used **generalized linear models** to examine which factors were most closely associated with the changes in the target variables in hospital-based EDs. I identified Gamma-distributed dependent variables for visit volume, wait time and discharge time with log-linked function. Poisson distribution was used for ED drop-out rate. The time efficiency regressions (wait time, discharge time and drop-out rate) were weighted by hospital visit volume. The estimated equation was the following:

where ***IFED, SED, and HBED*** represented independent freestanding ED, hospital satellite ED, and hospital-based ED, respectively. The **dependent variables** were hospital annual visits, median wait time, median discharge time, and annual drop-out rate. The **exploratory variables** included number of competitors and in the located PUMA *L* in year *t*. PUMA was also used to define the market and count number of competitors in the same areas. I also tested number of competitors within a 3-mile radius of a hospital, and the results were unaffected by using this measurement.

Whether owned satellite ED(s) by hospital i at time *t*, , was another crucial element in my analysis. I suggested those satellite EDs served as feeders to their parent hospitals by attracting patients far away from the main campus. They might also improve hospital efficiency by diverting patients to locations with short wait time. The owned satellite ED was not counted as a competitor in if it located in the same PUMA as its main hospital.

were demographic characteristics, including PUMA-level household income, percentage of residents above 65, percentage of Hispanic/Black residents, and population density. Some other relevant demographic characteristics were dropped due to multicollinearity concerns. I excluded variables with a variance inflation factor greater than 2.5 from the regressions. and controlled fixed effects for years and hospitals.

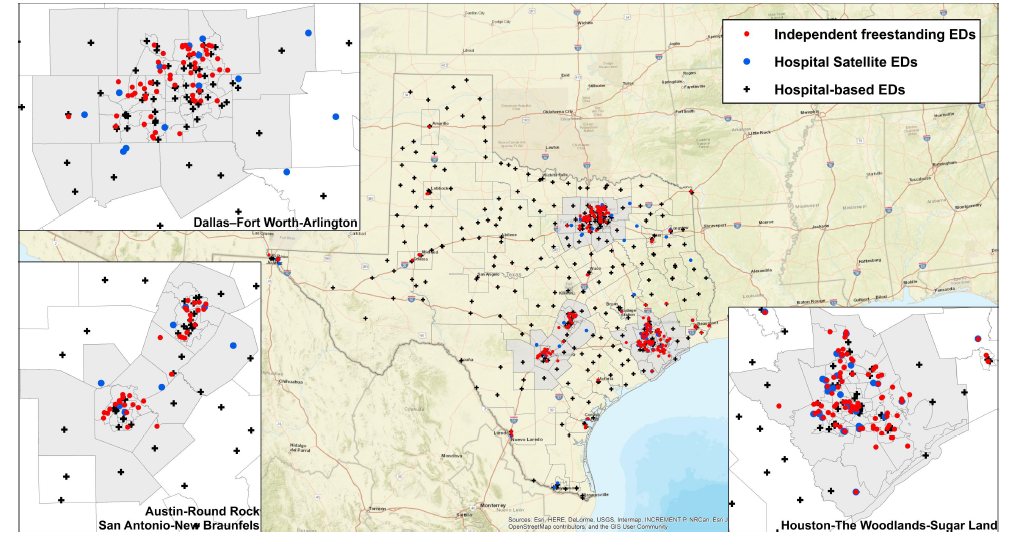
To avoid type II error for accepting the null hypothesis incorrectly, I also conducted **power calculation**[[12]](#footnote-12)[[13]](#footnote-13). With a probability of <0.05 for a type I error and a power level of 0.9, my sample sizes were large enough to detect differences if it existed.

**Results**

**Geographic Analysis:**

Figure 1 showed four major metropolitan areas in Texas, covering most of independent freestanding EDs and satellite EDs. Independent freestanding EDs and hospital satellite EDs were clustered around major metropolitan centers such as Houston, Dallas-Fort Worth, San Antonio and Austin. However, hospital-based ED were scattered throughout the state. Most of the satellite EDs were built close to their parent hospitals.

**Figure 1. Location of facilities providing emergency care in Texas, 2016 (ArcGIS)**



**SOURCE**: Author’s analysis of data from the American Hospital Association and the Texas Department of State Health Services. **NOTE**: There were 420 hospital-based emergency departments (black dots), 275 independent freestanding emergency departments (red dots), and 121 hospital satellite emergency departments (blue dots) in my sample. The grey areas are four biggest metropolitan areas in Texas, with the represented cities Dallas, Houston, Austin and San Antonio.

A total 288 independent freestanding EDs opened in Texas between 2010 and 2016, and 68 independent freestanding EDs had closed before the end of 2016. Independent freestanding ED exploded in Texas between 2014 and 2016 (Table 1 and Appendix Figure 1). Though satellite EDs were available before the licensing Act in Texas, the booming of independent freestanding EDs also brought development and prosperity of satellite EDs in this industry. Over 100 new satellite EDs were set up between 2010 and 2016.

**Table 1. Numbers of hospital-based emergency departments and freestanding emergency departments from 2010 to 2016**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Hospital EDs | Hospital EDs with visits>100 | Independent freestanding EDs | Hospital Satellite EDs |
| 2010 | 431 | 409 | 22 | 12 |
| 2011 | 427 | 407 | 28 | 20 |
| 2012 | 427 | 408 | 52 | 31 |
| 2013 | 426 | 410 | 88 | 39 |
| 2014 | 422 | 408 | 139 | 48 |
| 2015 | 417 | 401 | 208 | 66 |
| 2016 | 420 | 404 | 275 | 121 |

**Note:** The number of Independent freestanding EDs and Hospital Satellite EDs

**Descriptive Analysis:**

The descriptive statistics in Table 2 demonstrated that average hospital-based ED visits increased over the past 7 years. The annual growth rate of total visits was 2.3% in my sample. Wait times in the hospital-based ED and overall drop-out rates decreased from 2012 to 2016. However, the discharge time, which measured the time from ED arrival to ED departure for discharged patients, showed slightly increase.

**Table 2. Hospital-based emergency department visits, wait time, discharge time, and drop-out rate in Texas, from 2010 to 2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | HBED Visits  (Texas) | Visits/Pop  (Texas) | Avg. ED Visits  (N=370) | Wait Time  (N=276) | Discharge Time  (N=276) | Drop-out Rate  (N=271) |
| 2010 | 10,403,602 | 0.412 | 26,683 | - | - | - |
| 2011 | 10,606,956 | 0.413 | 27,517 | - | - | - |
| 2012 | 11,021,832 | 0.423 | 28,793 | 31.4 | 139.1 | 2.7 |
| 2013 | 11,061,800 | 0.418 | 28,560 | 29.4 | 137.8 | 2.2 |
| 2014 | 11,168,465 | 0.414 | 29,657 | 26.7 | 142.8 | 2.3 |
| 2015 | 11,464,788 | 0.417 | 29,829 | 24.8 | 141.9 | 2.1 |
| 2016 | 11,824,246 | 0.424 | 29,361 | 22.3 | 140.7 | 2.0 |

**Note**: The ED visits, wait time, discharge time and drop-out rate are annual average for hospitals in my sample for regressions.

Center for Medicare & Medicaid Services started collecting Hospital Emergency Department Timely and Effective care measurements in 2012.

**Regression Results:**

The results in Table 3 revealed that annual visits in hospital EDs were not associated with the entry of freestanding EDs. Neither the total number of freestanding EDs, nor the separate effects from independent freestanding EDs and satellite EDs were associated with hospital-based ED visits. The results remained the same with the tests for ED efficiency measurements. No significant association between the hospital-based ED wait time, discharge time, drop-out rates and the presence of freestanding EDs in the same PUMA. It failed to state that the establishments of freestanding EDs relieved congestions in local hospitals.

Setting up a hospital-affiliated satellite ED significantly increased owner hospitals’ visits (p<0.01). However, owning satellite EDs did not influence ED wait times, discharge times, and drop-out rates in owner hospitals, which means hospital-based ED congestion didn’t change by owning satellite EDs.

The year fixed effects showed the trends in hospital visits and ED congestion over time. ED visits increased over the past years compared to the base year 2010. The increased rates were significant with an increased magnitude, except for 2016. Contradict to visit volume, wait times and drop-out rates decreased over years regardless of increased visits. However, length of visit for discharged patients didn’t change much.

Changes in demographic characteristics did not show any significant impact on hospital visits. The PUMA-level percentage of patients over age 65 (usually insured with Medicare) increased ED visits, although the effect was imprecisely estimated (p<0.1).

The results were unaffected by using 3-mile distance bands of the hospitals to calculate nearby competitors (Appendix Table 1). The weights in the regressions did not change the main conclusions I had above (Appendix Table 2).

**Table 3. Estimates of the changes in hospital-based emergency departments, associated with nearby competitors and various factors in the same Public Use Microdata Area in Texas.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Visit Volume | Visit Volume | Wait Time | Discharge Time | Drop-out Rate |
| own SEDs (dummy) | 0.130\*\*\* | 0.129\*\*\* | 0.00162 | -0.0196 | 0.0432 |
| FSEDs in the puma | 0.00776 |  | 7.60E-05 | 0.00447 | -0.00195 |
| IFEDs in the puma |  | 0.00155 |  |  |  |
| SEDs in the puma |  | 0.0313 |  |  |  |
| Avg. HH income/10k | 0.0035 | 0.0036 | 0.0123 | -0.00333 | -0.0541 |
| Pop Density/10k | -0.7 | -0.75 | -1.071 | 0.226 | 1.751 |
| % Hispanic | -0.676\* | -0.686\* | 0.0972 | -0.156 | 0.0745 |
| % Black | -0.570\* | -0.578\* | -1.058 | 0.0258 | -1.58 |
| age\_above65 | 1.572\* | 1.523\* | -0.877 | -0.382 | -2.577 |
| year = 2011 | 0.0425\*\*\* | 0.0427\*\*\* |  |  |  |
| year = 2012 | 0.0661\*\*\* | 0.0655\*\*\* |  |  |  |
| year = 2013 | 0.0614\*\*\* | 0.0612\*\*\* | -0.0718\*\* | -0.0145 | -0.187\*\*\* |
| year = 2014 | 0.0596\*\* | 0.0601\*\*\* | -0.270\*\*\* | 0.0195 | -0.158\*\* |
| year = 2015 | 0.0675\*\* | 0.0686\*\*\* | -0.418\*\*\* | 0.0114 | -0.227\*\*\* |
| year = 2016 | 0.0352 | 0.0347 | -0.529\*\*\* | -0.00886 | -0.328\*\*\* |
| Constant | 10.96\*\*\* | 10.97\*\*\* | 3.990\*\*\* | 5.072\*\*\* | 0.425 |
| Obs. | 2,590 | 2,590 | 1,380 | 1,380 | 1,350 |
| Hospitals | 370 | 370 | 276 | 276 | 270 |
| Hospital Fixed Eff. | Yes | Yes | Yes | Yes | Yes |
| Weights | NO | NO | ED Visits | ED Visits | ED Visits |

**Note:** SED, IFED, and HBED are short for satellite ED, independent freestanding ED, and Hospital-based ED.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Discussion**

In this study, I did not find the evidence that the entry of freestanding EDs relieved ED visits in hospitals. However, the booming and survival of freestanding EDs in Texas suggested freestanding EDs found their business in local communities. It also suggested that the emergency service markets expanded by introducing more choices to consumers, with an increase in healthcare expenditure. The freestanding EDs might compete with primary care and urgent care in local communities. By offering high-profit services to non-emergency patients, they added burden to the already-expensive healthcare system by functioning as luxury products to well-insured patients. Previous work (Pines 2018) showed that almost all patients had private health insurance and had fewer comorbidities with data from 74 independent freestanding EDs during 2013 to 2015.

Another important finding in my study was that freestanding EDs didn’t relieve congestion problem in hospitals. Neither owning satellite EDs, nor having all kinds of freestanding EDs around helped ED reduce wait time, length of visit for discharged patients or drop-out rate. Owning satellite EDs did increase the visits, since satellite EDs billed insurance under the name of their parent hospitals. However, hospital ED efficiency was unaffected by owning satellite EDs, suggested the congestion problem remained in main hospitals.

In general, wait times and drop-out rates in the hospital-based EDs decreased over the past years, showed in the descriptive analysis (Table 2) and the regression results (Table 3). On the one side, it was possible that hospitals spared efforts to reduce wait times, since those indicators were main measurements in the CMS’s Hospital Compare survey. Hospitals usually advertise their current ED wait times on the website to attract patients. On the other side, patients might also choose hospital strategically by checking wait time online. Noticeably, the study showed the length of visit for discharged patients did not change much, suggesting times for overall procedure didn’t improve. The anxiety about improvement in ED efficiency remained.

Setting up satellite EDs is a way to attract patients and gain more market share. They function like feeders to owner hospitals and attract patients by their big brand names in local markets. Under current payment system for ED visits, providers have incentives to add new satellite EDs, rather than independent freestanding EDs or urgent care centers, to get reimbursements from public and private insurances. In the past few years, more and more hospitals established satellite EDs in local communities. Houston Methodist and CHI St. Luke’s Health set up 8 and 10 satellite EDs, respectively. Besides, independent freestanding EDs also started working with hospitals to get better payments. 27 First Choice freestanding EDs under Adeptus Health became aligned with Texas Health Resources in Dallas-Fort Worth areas[[14]](#footnote-14) in early 2016. First Texas Hospital (Houston) also opened in 2016 to take care of claims in First Choice freestanding EDs in Houston area.

There is considerable ongoing debate about the value and cost of freestanding ED services. To ensure appropriate use of emergency services and avoid over-payment to low-acuity emergency visits, the 2018 MedPAC report[[15]](#footnote-15) suggested reducing Medicare payment rates for those visits in satellite EDs in urban areas. The payment from Medicare payment can dent freestanding EDs’ prospects. In addition, the freestanding ED ACT did not solve one of its initial purposes – help patients access care in emergency service shortage areas. Almost all the freestanding EDs in Texas found their roots in urban wealthy communities (Dark et al., 2017). The current policy fails to address the concerns “Improve efficiency and preserving access to emergency care in rural areas” raised in the 2016 Report to the Congress[[16]](#footnote-16).

From the patients’ perspective, it is also a paradox to using freestanding EDs to wean them from hospital congestion. For those with low acuity and no priority to get immediate treatment in hospital EDs, the congestion may also be a way to keep them away from unnecessary high-cost ED services. Many patients complained on Google review or Yelp that the charges from freestanding EDs, especially independent freestanding EDs were unexpected. People assumed it would be at similar rates to those urgent care centers or clinics in local communities. But the cases hurt the most was that most private insurance companies rejected the bill from independent freestanding EDs since they were out-of-network providers. Patients were often left to pay the balance of thousand-some emergency bills on their own[[17]](#footnote-17). Though news and criticism on social media are informative, it is not the best way to educate the public how to distinguish true emergency cases.

Overall, I am concerned that the current policy, instead of relieving the hospital burden, stimulates the demand for emergency services and expand healthcare spending by siphoning off patients from urgent care centers and physician offices to the high cost ED setting. In addition, by focusing on low-acuity and well-insured patients, freestanding EDs may have negative impact on the financial status of hospital-based EDs.

**Limitations**

My research has a number of limitations. The first is the inability to separate the visits in main hospitals and its satellite EDs. Noticeably, the increase in ED visits stems in part from building up satellite ED sites. Though I found significant increase in visits by owning satellite EDs, it is hard to suggest whether the increased visits were fully contributed by the satellite EDs. If the main hospitals also had strong increase in ED visits compared with hospitals without satellite EDs, then no changes in wait times or drop-out rates did not mean hospitals had not put efforts to solve overcrowding situations. In addition, the AHA data doesn’t provide hospital population information. It is hard to measure whether the visit volume reach hospital capacity. No influence in volume of visits and wait times may due to hospital capacity. It is possible that the entry of freestanding EDs changed population structure in traditional EDs by attracting low-acuity and well-insured patients away from hospitals. The entry might make hospitals financial vulnerable.

My provider data only limits to the locations of hospital-based EDs and two types of freestanding EDs. I do not have entry and exit data of urgent care centers, or physician offices. If available, the number of those providers in the markets could be another explanatory variable in my analyses to show market competition.

Finally, the opening and closing dates of satellite EDs are collected through website search and phone call to their located sites. It was hard to catch up with every ownership change, hospital acquisition or merge. By contrast, the independent freestanding ED data came from the Texas Department of State Health Services official records were more accurate. Additionally, I manually assigned each satellite ED to its closest parent hospital(s) if there were more than one campus under the hospital system. For example, the Houston Methodist satellite EDs in Sugar Land area, which is more than 20 miles away from downtown Houston, were assigned to Houston Methodist- Sugar Land campus.

**Conclusion**

My research suggested the entry of freestanding EDs had no impact on reducing ED congestion in nearby hospitals, different from traditional views by many physicians and policy makers that freestanding EDs might reduce patient volume at nearby hospital-based EDs. The freestanding EDs nearby, neither decrease visit volume, nor improve effectiveness in hospital-based EDs, might serve as supplements rather than substitutes to the already-expensive healthcare system and function as luxury products to well-insured patients. My work also showed setting up hospital-affiliated satellite EDs increased owner hospitals’ visits, but it didn’t help with the congestion problem in their main hospitals. These findings convey valuable information for the current debate over the cost and regulations towards the freestanding EDs in the U.S. The initial hopes of the policy have so far proved misplaced. It shifted the incentives from relieving hospital congestion to creating more demand. Regulators must closely consider how to implement effective low-cost solutions to ED crowding.

It calls for future research about how freestanding EDs impact overall health care population and healthcare costs within a community, or how population changes within a hospital. My work also raises questions to the benefits in patients’ perspective, and how the freestanding EDs will response to a reduction in insurance reimbursement.

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**Appendix**

**Appendix Figure 1. Texas Independent Freestanding Emergency Departments: Timing of Opening and Closings**

**Note:** IFED stands for independent freestanding emergency department. Most of the closures happened in 2016 and 2017 were related to hospital acquisition, which means those independent freestanding EDs became hospital-affiliated satellite EDs. So far as observed, 59/113 closures between 2010-2017 were true closure, not related to any ownership change.

Appendix Table 1. Estimates of the changes in hospital-based emergency departments, associated with nearby competitors and various factors in 3-mile distance bands of the hospital-based emergency departments in Texas

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Visit Volume | Visit Volume | Wait Time | Discharge Time | Drop-out Rate |
| own SED | 0.131\*\*\* | 0.131\*\*\* | -0.00172 | -0.02 | 0.0419 |
| FSEDs in 3 miles | 0.0034 |  | -0.0283 | -0.00324 | -0.0282 |
| IFEDs in 3miles |  | 0.0155 |  |  |  |
| SEDs in 3miles |  | -0.0569 |  |  |  |
| Avg. HH income/10k | 0.00467 | 0.00553 | 0.0123 | -0.00314 | -0.0541 |
| Pop Density/10k | -0.689 | -0.559 | -1.05 | 0.207 | 1.757 |
| % Hispanic | -0.687\* | -0.669\* | -0.0131 | -0.174 | -0.0253 |
| % Black | -0.554\* | -0.501 | -1.13 | 0.0238 | -1.666 |
| age\_above65 | 1.572\* | 1.698\* | -0.942 | -0.416 | -2.582 |
| year = 2011 | 0.0427\*\*\* | 0.0416\*\*\* |  |  |  |
| year = 2012 | 0.0665\*\*\* | 0.0665\*\*\* |  |  |  |
| year = 2013 | 0.0619\*\*\* | 0.0602\*\*\* | -0.0706\*\* | -0.0136 | -0.186\*\*\* |
| year = 2014 | 0.0608\*\*\* | 0.0575\*\* | -0.265\*\*\* | 0.0218 | -0.154\*\* |
| year = 2015 | 0.0701\*\*\* | 0.0644\*\* | -0.406\*\*\* | 0.0162 | -0.218\*\*\* |
| year = 2016 | 0.0401 | 0.0376 | -0.508\*\*\* | -0.000381 | -0.311\*\*\* |
| Constant | 10.96\*\*\* | 10.92\*\*\* | 4.090\*\*\* | 5.097\*\*\* | 0.511 |
| Obs. | 2,590 | 2,590 | 1,380 | 1,380 | 1,350 |
| Hospitals | 370 | 370 | 276 | 276 | 270 |
| Hospital Fixed Eff. | Yes | Yes | Yes | Yes | Yes |
| Weights | NO | NO | ED Visits | ED Visits | ED Visits |

**Note:** SED, IFED, and HBED are short for satellite ED, independent freestanding ED, and Hospital-based ED.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 2. Estimates of the changes in hospital-based emergency departments, associated with nearby competitors and various factors in the same Public Use Microdata Area in Texas (without weights)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Wait Time | Discharge Time | Drop-out Rate |
| own SED (dummy) | -0.0845 | -0.0323 | -0.0827 |
| FSEDs in the puma | -0.0144 | -0.0022 | -0.0121 |
| Avg. HH income/10k | -0.0453 | 0.00858 | -0.0513 |
| Pop Density/10k | -2.059\*\* | -0.0584 | 2.828\*\* |
| % Hispanic | -0.311 | -0.0146 | -0.244 |
| % Black | -1.513\* | -0.0103 | -1.056 |
| age\_above65 | -1.519 | -0.46 | -1.379 |
| year = 2013 | -0.0351 | -0.00387 | -0.206\*\*\* |
| year = 2014 | -0.145\*\*\* | 0.0329\*\* | -0.145\*\* |
| year = 2015 | -0.188\*\*\* | 0.0289\* | -0.213\*\*\* |
| year = 2016 | -0.256\*\*\* | 0.0302 | -0.274\*\*\* |
| Constant | 4.989\*\*\* | 5.003\*\*\* | 0.228 |
| Obs. | 1,380 | 1,380 | 1,350 |
| Hospitals | 276 | 276 | 270 |
| Weights | NO | NO | NO |

**Note:** SED and HBED are short for satellite ED and Hospital-based ED.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

1. Available at: https://www.cdc.gov/nchs/fastats/emergency-department.htm [↑](#footnote-ref-1)
2. Data from the American Hospital Association’s Annual Survey [↑](#footnote-ref-2)
3. Texas Freestanding Emergency Medical Care Facilities Available at: https://www.dshs.texas.gov/facilities/freestanding-emergency-rooms/ [↑](#footnote-ref-3)
4. Ashwood (2016) [↑](#footnote-ref-4)
5. Dark (2017) [↑](#footnote-ref-5)
6. Schuur [↑](#footnote-ref-6)
7. Ho (2017) [↑](#footnote-ref-7)
8. Pines (2018) [↑](#footnote-ref-8)
9. Report to The Congress: Medicare and the Health Care Delivery System [↑](#footnote-ref-9)
10. News [↑](#footnote-ref-10)
11. [↑](#footnote-ref-11)
12. An introduction to power and sample size estimation (Jones, et al. 2003) [↑](#footnote-ref-12)
13. Muller (1992) [↑](#footnote-ref-13)
14. <https://www.texashealth.org/news/texas-health-resources-and-adeptus-health-join-forces-to-enhance-access-to-emergency-care-in-north-texas> [↑](#footnote-ref-14)
15. Report to The Congress: Medicare and the Health Care Delivery System [↑](#footnote-ref-15)
16. 2016 Report to the Congress – Medicare and the Health Care Delivery System [↑](#footnote-ref-16)
17. Rice 2016, Sutherly 2016 [↑](#footnote-ref-17)
18. commercially insured patients were most profitable and Medicaid patients were least profitable. publicly insured ED outpatients with higher acuity (billing level) are less profitable than similar, commercially insured patients. [↑](#footnote-ref-18)
19. The opening of an FED was associated with a modest improvement in time-specific EMS system metrics: a decrease in ambulance turnaround time and shorter out-of-service intervals. [↑](#footnote-ref-19)
20. [↑](#footnote-ref-20)
21. Anthem Blue Cross Blue Shield, the nation’s largest health insurer, is expanding its policy of not paying for emergency room (ER) care that it decides was not an emergency [↑](#footnote-ref-21)