Exploring Cost Avoidance in Area Hospitals

The Impact of Burke's Mental Health Emergency Center

Bill Rago PhD, MBA
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Executive Summary

Burke's Mental Health Emergency Center (MHEC) opened in 2008 as an innovative option to hospital emergency room services for area residents experiencing a mental health crisis. In 2013 MHEC received the National Council for Behavioral Health's award for innovation in service as the "…first freestanding, comprehensive rural emergency program where psychiatric emergencies are handled entirely via telemedicine." _MHEC has become a major provider in the area's healthcare safety net. The MHEC has served over 11,000 residents, most of whom fall in the category of low income. This study was undertaken to explore the impact MHEC has had by estimating the emergency room (ER) and inpatient costs avoided by area hospitals. Underlying the study's methodology is the assumption that in the absence of MHEC its patients would have no recourse but to seek treatment in a hospital which would lead to an ER visit and possibly, an admission to the hospital.

The data used in the estimates of cost avoidance comes from the Department of State Health Services' (DSHS) hospital discharge and outpatient databases which use UB-04 claim forms collected from Texas hospitals.

While several assumptions are necessary to conduct the analyses in this study, the most significant concerns comparability, that is, the assumption that the patients treated at MHEC are similar to patients admitted to the area hospitals or seen in their ERs. If MHEC patients are less ill they could be less expensive to treat and therefore, make it difficult to assume that the costs incurred by a hospital, as measured by the hospital claim forms, are equivalent to what they would be if they had treated MHEC patients. To address this issue of comparability for hospital admissions only patients in area hospitals who had an MS-MDC indicator of 19 were identified for inclusion in the study. For ER visits, the MS-MDC=19 indicator was not on the outpatient database, in its place is the Agency for Healthcare Research and Quality's (AHRQ) Clinical Classification Software (CCS) coding format. For ER visits, codes 657 and 659 were used to identify ER visits for patients with a serious mental illness.

The initial impact of MHEC on a hospital is likely to be on preventing ER visits. In estimating ER cost avoidance, two analyses were conducted. The first looked at the cost avoidance associated with ER visits, and the second went beyond the ER cost to estimate the cost avoided for the entire visit of which ER costs are a subset. The total visit cost avoidance in 2016 is estimated at $945,000.

The second set of analyses assumed that MHEC patients would have been admitted, at some frequency, to area hospitals in the absence of MHEC. The 100% admission model assumed that all MHEC patients would be admitted to the hospital. The major assumption underlying this model is that MHEC's clinical practice of evaluating presenting patients suggests that if MHEC patients were to present in an ER (in the absence of MHEC) their clinical condition would lead to an admission. Based on this model in 2016 MHEC-generated cost avoidance is estimated at approximately $3.8 million for all area hospitals.

Because of the uncertainty as to what costs area hospitals would incur in the absence of MHEC a range was identified within which the total estimated cost avoidance might be expected. The ranges' upper boundary is from Bilthe 100% admission model. The lower boundary is based on cost avoidance estimates in the 50% admission model. This model is a combination of the total visit cost avoidance (total costs for patients with an ER revenue code on the outpatient claim form) and inpatient avoided costs based on the 50% model's assumption. The 50% model adds total visit costs to inpatient costs under the assumption that if a patient was admitted to the hospital, his or her ER-related costs would be

included in the inpatient costs. Therefore, the only ER total visit costs that count towards cost avoidance are those for patients not admitted to the hospital.

The boundaries for the final estimate of MHEC-created cost avoidance in area hospitals are in the table below. The expected cost avoidance estimates for 2016, for example, lie between $2.7 million and $3.8 million. Given the assumptions of this study, it is likely that the expected cost avoidance is closer to the lower boundary.

Range for Estimating Cost Avoidance Created by MHEC in Area Hospitals (in Millions)

	2010	2011	2012	2013	2014	2015	2016
Upper Boundary Estimate	$2.8	$3.1	$2.9	$2.8	$3.3	$3.3	$3.8
Lower Boundary Estimate	$2.3	$2.9	$2.6	$2.3	$2.5	$2.4	$2.7

Introduction

The Mental Health Emergency Clinic (MHEC) opened in the last quarter of 2008 and was designed as a response to the state's budget crisis which eliminated funding for psychiatric beds in East Texas, forcing area residents in crisis to use local hospital ERs. The National Council for Behavioral Health awarded its 2013 innovation in service award to MHEC for the "…first freestanding, comprehensive rural emergency program where psychiatric emergencies are handled entirely via telemedicine. Registered nurses provide 24/7 telephone triage to expedite admissions and patients see a psychiatrist within 30 minutes via videoconference. The rapid response allows for a quick de-escalation of psychiatric symptoms through medications and interventions provided by physicians and onsite staff."[1]

This study was undertaken to explore the impact MHEC has had by estimating the ER and inpatient costs avoided by area hospitals. Underlying the study's methodology is that assumption that in the absence of MHEC its patients would have no recourse but to seek treatment in a hospital which would result in an ER visit, and possibly, an admission to the hospital.

Since Burke opened ten years ago, it has treated almost 11,000 county residents in crisis while providing over 30,000 bed days. It is this workload that would have been transferred to area hospitals if it were not for the creativity and dedication of Burke leadership and staff in designing, implementing and caring for individuals in crisis. The following analysis explores the impact of this innovative treatment program on the costs that would otherwise have been experienced by area hospitals.

The timely provision of care in the patient's community is a critical component of the quality care necessary for preventing the escalation of illness. Inherent within the concept of quality care is the ability to control the growth in healthcare cost through the potential to prevent the occurrence of increasingly costly treatment environments, including hospitalization. Controlling the growth in costs is a significant objective of innovation in healthcare and particularly important in Texas where hospitals providing care to low-income Texans have significant amounts of uncompensated care. Attachment A has a detailed discussion of the impact of uncompensated care on hospitals in Texas.

In Texas, unreimbursed hospital cost comes primarily from patients without any healthcare coverage (the indigent) and, interestingly, from Medicaid patients. It is these two populations that are the major focus of MHEC's services. By focusing on the low-income residents within its service area, MHEC has created for itself a significant role in the area's healthcare safety net which has a significant impact on the patient mix of area hospitals. It is within this healthcare context that this analysis looks at the value of MHEC by exploring its impact on the costs area hospitals have avoided over the last several years.

[1] The National Council for Behavioral Health 2013. https://www.thenationalcouncil.org/about/awards/201-honorees/.

Methodology

The objective of this analysis is to estimate the degree to which MHEC's services allow hospitals in the area to avoid costs for this patient population. In this analysis cost avoidance is defined as costs that a hospital avoided due to MHEC's presence in the area safety net. The value of MHEC's role in the safety net is based on estimating the ER and inpatient costs avoided by hospitals. The data used for this analysis comes from the Department of State Health Services' (DSHS) two hospital databases. The analysis of inpatient costs is based on the hospital discharge database. This database is built off the UB-04 hospital claim forms sent to DSHS by Texas hospitals from 2009 to 2016. The second DSHS database also uses the UB-04 form to capture hospital outpatient data, including ER data, for 2010 to 2016.[2]

Modeling the Allocation of MHEC Patients to Area Hospitals

The strategy for estimating the value of MHEC in terms of the costs avoided by area hospitals is to estimate what the costs to these hospitals would have been if MHEC did not exist. In the absence of MHEC, it is assumed that area residents would continue to access area hospitals for treatment as they did prior to the opening of the MHEC program. This assumption leads to the correlated assumption that mental health patients would have accessed area hospitals at the same relative frequency as each hospital experienced during the period covered by this study.

For each 'area hospital' the number of seriously mentally ill (SMI) patients discharged from the hospital (or had an ER visit) was identified from the claims data and a total cost was calculated. For the year, a total cost for all hospitals was calculated by summing each hospital's costs and dividing this sum by the number of patients discharged from all hospitals or who had an ER visit. In estimating the total cost avoidance for a year, the annual number of MHEC admissions was multiplied by the average cost, and the result is an estimate of the total avoided costs for a year.

This methodology weights the influence of each hospital in the calculation of the average cost. If a particular hospital had a high frequency of discharges or ER visits for a particular year, its costs would have a proportional effect on the estimate of cost avoidance.

Identifying an Area Hospital

Patients from Burke's 12-county service area constitute the universe for this analysis. The discharge claim form identifies the patient's county of residence at the time of admission. A patient from one of the 12 counties can be admitted to any Texas hospital, which was typically the case. An analysis of hospitals with claim forms from these counties indicated that many hospitals could be treating patients in any given year. To identify an area hospital only hospitals were included that had ten or more discharge claims in a year for patients in the 12-county area who also had a mental health diagnosis. While this method may limit the number of hospitals in the analysis it does not have a significant impact on the estimated cost since it is likely that the treatment costs of the hospitals not included would be similar to those included in the analysis.

[2] Texas Hospital Inpatient Discharge Public Use Data File. Texas Department of State Health Services, Austin, Texas. For ER data which is from the DSHS outpatient database does not have a full year of data until 2010.

Comparability: Identifying a Mental Health Patient Discharge

A major issue in identifying cost avoidance associated with MHEC patients is assuming that the patients treated at MHEC are like patients admitted to the area hospitals or seen in their ERs. If MHEC patients are less ill they could be less expensive to treat and therefore, make it difficult to assume that the costs incurred by a hospital, as measured by the discharge claim forms, are equivalent to what they would be if they had treated MHEC patients. To address this issue of comparability for hospital admissions only patients in area hospitals who had a MS-MDC indicator of 19 were identified for inclusion in the study. For ER visits, the MS-MDC=19 indicator was not available on the outpatient claim form. In its place, the Agency for Healthcare Research and Quality's (AHRQ) Clinical Classification Software (CCS) coding format was used. For ER visits, codes 657 and 659 were used to identify ER visits for patients with a serious mental illness.

A major diagnostic category (MDC) is a grouping of all principal diagnostic ICD-9 codes (or ICD-10) that correspond to a single organ system or cause and, in general, are associated with a particular medical specialty. MS-MDC=19 groups principal diagnoses related to mental diseases and disorders. This approach was viewed as the most appropriate for making the comparison between MHEC patients and those admitted to area hospitals. AHRQ's CCS coding system is similar to the MS-MDC grouper methodology. In this case, CCS = 657 includes ICD-9 codes (or ICD-10) associated with mood disorders while CCS = 659 groups codes associated with psychotic disorders.

Even using the MS-MDC diagnostic grouping for comparability, there were hospital admissions that had length-of-stays suggesting that the patient might be medically complex. The presence of medical complexity on the impact of cost would present a problem for the MHEC comparison since the admission criteria for MHEC rules out medically complex patients (i.e., patients with medical co-morbidities). To address this potential issue, patients admitted to area hospitals with a MS-MDC =19 diagnosis who had a length-of-stay greater than seven days were excluded from the study. The rationale for using seven days as the upper limit for length-of-stay came from a study commissioned by DSHS in 2014.[3] In this study, the authors estimated the average length-of-stay in community psychiatric hospitals to be 6.7 days. Length-of-stay is not an issue for ER visits.

Because state psychiatric hospitals have disproportionately long length-of-stays they were excluded from the study. While Burke area residents had admissions to all of Texas' state psychiatric hospitals, the state hospital with the highest frequency of admissions was Rusk State Hospital.

The UB-04 claim form allows the hospital to record not only a primary diagnosis but also up to 24 diagnoses. The DSHS outpatient database has a supplemental file that classifies the outpatient visit diagnosis according to the CCS grouper as discussed above. This means that an ER patient could have a CCS = 657 or 659 diagnosis in the primary diagnosis field or in one of the other additional diagnosis fields. For the ER analyses patients with a serious mental illness CCS diagnosis code in the primary diagnosis field were included in the cost avoidance analysis. However, a couple of analyses presented below includes the 'first other diagnosis' option. The result of adding this second diagnostic field to the analysis is to increase the number of patients with an ER visit.

[3] *Analysis for the Ten-Year Plan for the Provision of Services to Persons Served by State Psychiatric Hospitals*, November 2014. https://www.dshs.texas.gov/mhsa/reports/SPH-Report-2014.pdf

Ratio of Cost-to-Charges

Discharge claim forms are populated with charges (not costs) which creates the issue of converting hospital charges to costs. This conversion was accomplished by retrieving a ratio of cost-to-charges (RCC) from CMS' Medicare Cost Report website. Since the RCC is likely to change each year it was necessary to obtain the RCC for each hospital for each year of the study.[4] For the inpatient analysis a cost for each claim was calculated by multiplying the 'total charges' field on the UB-04 form by the hospital's RCC. For the ER analysis, in addition to using total charges, revenue codes were used to identify ER costs.

Exploratory Nature of the Analysis

The methodological assumptions discussed above underlie the structure of the analysis while also acknowledging its exploratory nature. Presentation of the results is divided into two sections:

Section 1: Estimating Cost Avoidance for Hospital Outpatient Visits

Section 2: Estimating Cost Avoidance for Hospital Admissions

Results

Section 1: Estimating Cost Avoidance for ER Visits

When estimating what the cost would have been for a MHEC patient if he or she had to go to a hospital ER an interesting question arises: what costs are associated with the ER visit? In reviewing the outpatient claims it appears that a patient can have an ER cost yet, on the same visit, also incur other costs that are identified on the claim by different revenue codes from those used for the ER costs. When looking at cost avoidance does the intervention of MHEC allow the hospital to avoid all the costs associated with the ER visit even if these are coded as non-ER costs or does the presence of the other costs indicate that the patient is not comparable to the MHEC patient? Because the CCS code for the principal diagnosis identifies the visit as related to the need for mental health treatment it may be assumed that the total visit cost was avoided.

[4] The CMS website for calculating RCCs: (https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Cost-Reports/Hospital-2010-form.html). In some cases it was not possible to find a hospital's RCC. Typically, this occurred where a hospital did not report all the data necessary to calculate its RCC. When this occurred the RCC was calculated by averaging the RCCs for its reported years. For the ER analysis the calculation of the hospitals' RCCs came from the same 'C1' worksheet.

The total visit cost in Figure 1 is based on this assumption. It estimates the avoided cost for area hospitals for each year of the study. Figure 1 also tracks the cost of the ER visit which is a subset of the total cost. In a sense, Figure 1 provides two estimates of the cost avoidance realized by area hospitals.

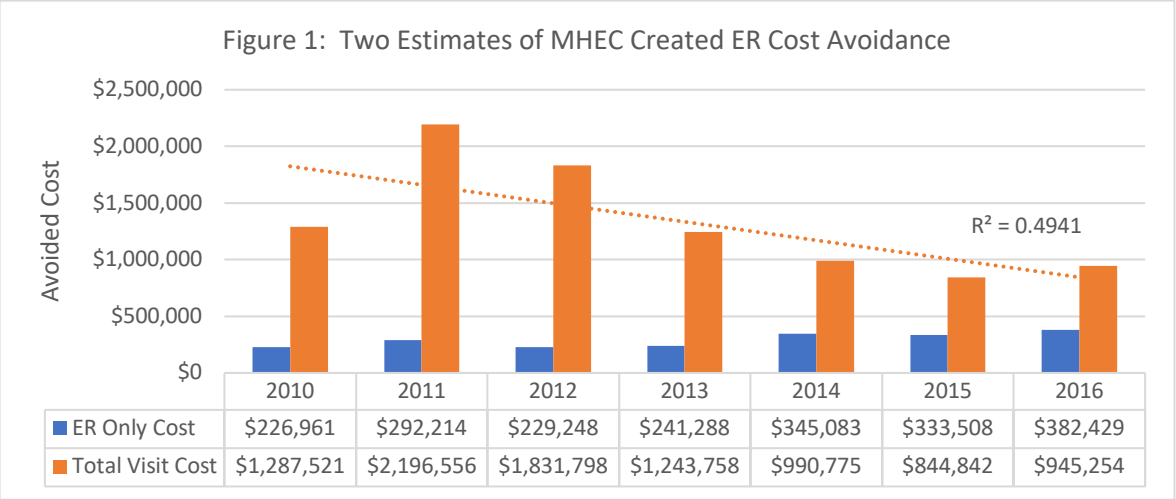


Table 1 explores the differences between ER and total visit costs for patients from Burke's 12-county service area who were also SMI. While the ER-only cost in 2010 averaged $206, for patients with an ER visit, the average total visit cost was $1,167. From 2010 to 2016 the number of visits increased, reaching a high in 2015 at 822 ER visits which was a 300% increase from 2010. [5] At the same time, the average total visit cost trended downward at a rate of 45%. The ER portion of the total visit cost increased slightly during this period from a low in 2010 of $206 per visit to a high in 2016 of $261.[6]

Table 1: Estimated Claims-Based Costs and Visits for ER Only and Total Visit (where ER Cost is Subset)

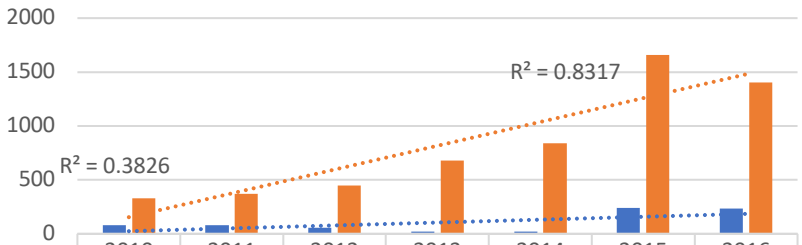
	2010		2011		2012		2013		2014		2015		2016	
	Avg Cost	**Visits**	**Avg Cost**	**Visits**	**Avg Cost**	**Visits**	**Avg Cost**	**Visits**	**Avg Cost**	**Visits**	**Avg Cost**	**Visits**	**Avg Cost**	**Visits**
ER Only	$206	204	$254	238	$233	227	$228	327	$261	410	$256	822	$261	770
Total Visit	$1,167	204	$1,909	238	$1,859	227	$1,174	327	$749	410	$649	822	$646	770

[5] The ER visits in Table 1 are from the DSHS's outpatient database. In the hospital discharge database ER costs are included in the inpatient total charges for the claim. If hospital admissions where an ER cost was identified are included in the estimate of total ER visits, the 'Number of Visits' column in Table 1 increases to 350 in 2010, 394 in 2011, 386 in 2012, 427 in 2013, 507 in 2014, 929 in 2015 and in 2016 to 892.

[6] In looking at the revenue codes for the non-ER portion of the total cost, most were for imaging, medications and laboratory procedures.

Perhaps the trend in Table 1 that describes the increase in ER visits is related to the expansion of insurance made possible by the implementation of the Affordable Care Act. That is, could newly available insurance coverage have driven the increase in ER visits? Figure 2 looks at this possibility by analyzing the frequency of ER visits between indigent and insured patients (those with some form of coverage) from Burke's service area. The trend for insured ER visits (R^2 =.83) supports the growth in payer covered ER visits.[7] At the same time, indigent ER visits have remained low which may affirm the continuous clinical impact that MHEC has had on this population.

Figure 2: Frequency of Indigent SMI ER Visits Compared to Non-Indigent SMI Visits

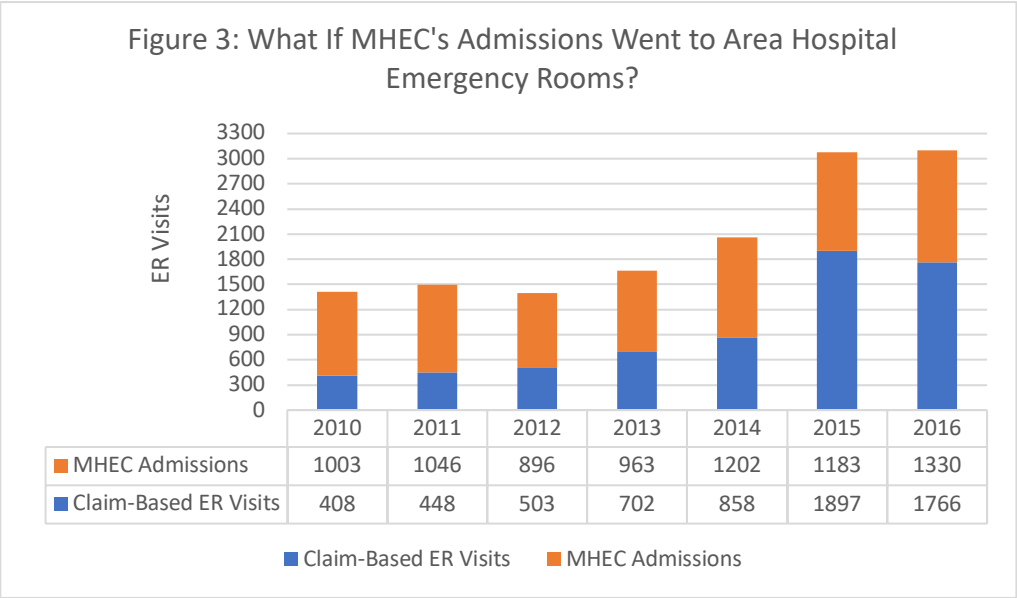


	2010	2011	2012	2013	2014	2015	2016
Indigent SMI ER Visits	79	80	56	23	21	241	233
SMI Non-Indigent ER Visits	329	368	447	679	837	1656	1401

Indigent SMI ER Visits
SMI Non-Indigent ER Visits
Linear (Indigent SMI ER Visits)
Linear (SMI Non-Indigent ER Visits)

In looking at MHEC's payer mix (Table B1 in Attachment B), it is clear that it is a major provider in the area's safety net for low-income residents. In 2010, indigent patients were 59% of admissions, and by 2016 these admissions had increased to 67%. Figure 3 hypothesizes what area hospital ERs would have looked like if MHEC was not there to enable hospitals to avoid these visits and their related costs.

[7] An R^2 = .83 means that 83% of the variance in the estimate of ER visits is accounted for by the change in years. As time goes on more and more patients with an SMI diagnosis and who have coverage may be expected to visit the ER. On the other hand, the low R^2 for the indigent ER visits indicates that the passage of time is not a significant variable and that there are other reasons why SMI indigent individuals access the ER. It is possible that one of these reasons is the presence of MHEC.



While hospitals have experienced an increase in the number of ER visits for SMI patients, it appears from Figure 2 that many of these visits are insured. Since the majority of MHEC's population is indigent, if hospitals were unable to avoid these patients their ER costs would not only increase but also, they would be largely unreimbursable as well.

Table 2 compares the frequency of ER visits using only the principal diagnosis as the basis for identifying SMI individuals to the frequency when the first other diagnostic field is included. In 2010 there were 204 ER visits with a principal diagnosis of SMI (as determined by the CCS grouping methodology). In the same year, an additional 204 SMI patients had an ER visit as determined by the presence of these codes in the 'first optional diagnosis' field on the outpatient claim.

Table 2: ER Visit Frequency and CCS Diagnosis Codes

	2010	2011	2012	2013	2014	2015	2016
Primary Diagnosis	204	238	227	327	410	822	770
Primary & 1st Other Diagnoses	408	448	503	702	858	1,897	1,766

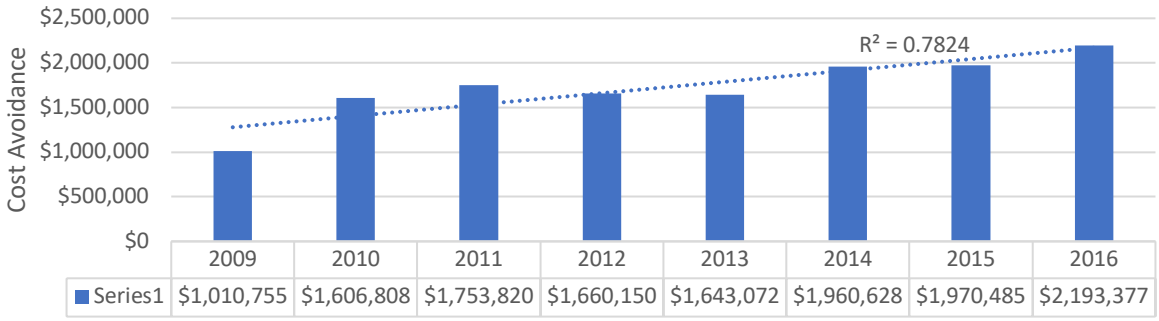
Section 2: Estimating Cost Avoidance for Hospital Admissions

Over the years patients admitted to MHEC, in general, have an average length-of-stay of approximately three days. This suggests that in its absence not only would individuals with a mental health diagnosis access area hospital ERs, but it would be likely that the severity of their illness could have led to an

inpatient admission. In 2015 a National Center for Health Statistics (NCHS) study of ER visits for adults with schizophrenia found that almost 50% of patients in the ER were admitted to the hospital.[8]

Based on the NCHS findings Figure 4 estimates the cost avoidance experienced by area hospitals from 2009 to 2016.[9] If all MHEC patients in 2009, in the absence of MHEC, were to access area hospital ERs for treatment and one-half were eventually admitted to the hospital, the total cost avoidance is estimated at just over $1 million and by 2016 it had grown to almost $2.2 million. While the cost of inpatient care has increased through the years, the major factor driving this growth is the increase in MHEC patients.[10]

Figure 4: Estimated Hospital Inpatient Cost Avoidance (50% ER Admission Model)

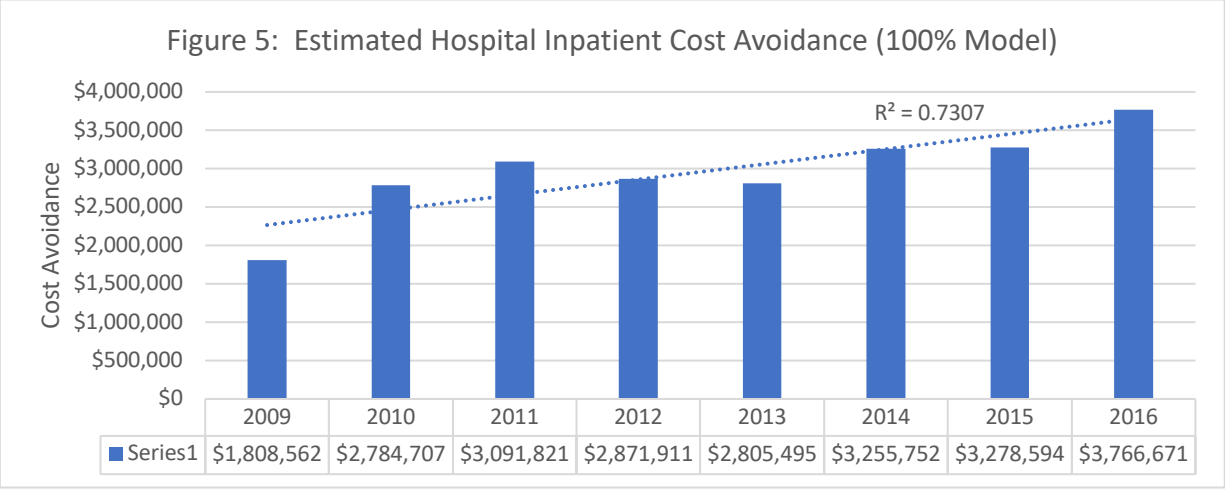


	2009	2010	2011	2012	2013	2014	2015	2016
Series1	$1,010,755	$1,606,808	$1,753,820	$1,660,150	$1,643,072	$1,960,628	$1,970,485	$2,193,377

An interesting question arises when applying the NCHS study findings to cost avoidance for MHEC patients. In the NCHS data, individuals accessed hospital ERs, and were diagnosed as to whether their presenting condition required admission. In looking at the role of MHEC, when an individual comes for treatment (as a referral, walk-in or conveyed by police), MHEC evaluates the patient for admission to a crisis bed where the average length-of-stay is around three days. Thus, the comparison to NCHS' finding of 50% of ER visits leading to an admission may be conservative when applied to the impact of MHEC on hospital admissions.

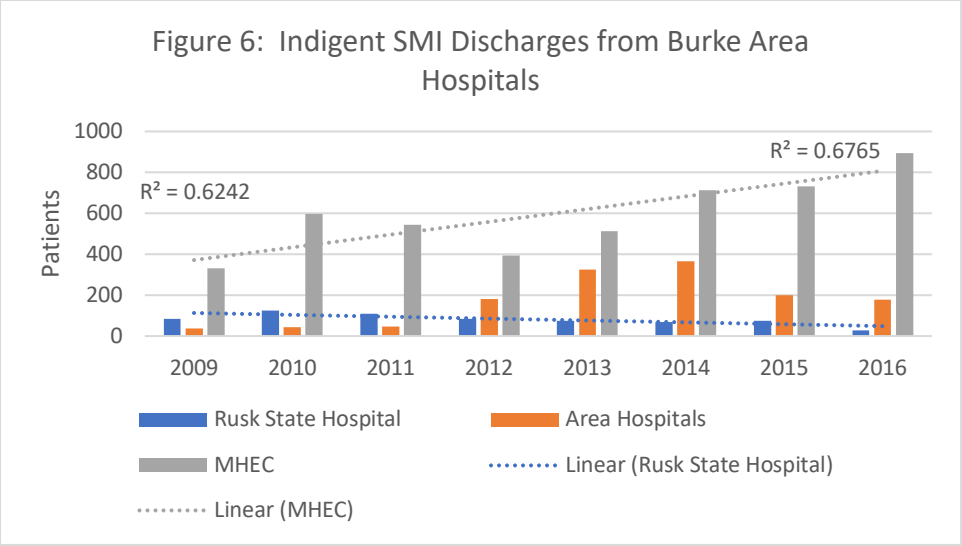
Figure 5 assumes 100% of MHEC's patients (after subtracting MHEC patients referred to another hospital) are admitted to an area hospital. Under this assumption, in 2016 MHEC's role in the area healthcare safety net enabled hospitals to avoid an estimated $3.8 million.

[8] Michael Albert and Linda McCaig, *Emergency Department Visits Related to Schizophrenia Among Adults Aged 18 – 64 United States, 2009 – 2011.* National Center for Health Statistics Data Brief No. 215—September 2015.
[9] As discussed in the methodology section, an average cost is calculated from the inpatient costs and number of discharges for area hospital patients with a MS-MDC = 19 diagnostic code who had a length-of-stay of 7 days or less. This average cost was multiplied by the number of MHEC patients for the year.
[10] In estimating the amount of cost avoidance, the number of MHEC patients are multiplied by an estimate of the average cost for area hospital discharges for patients with a CCS code of 657 or 659. As the number of admissions increase so will the estimate of cost avoidance.



In looking at MHEC's role in the safety net for low-income residents, the changing role of the state psychiatric hospital has a significant effect. In DSHS' 2014 legislatively required ten-year plan the author's write "Over the past few years an increase in the number of consumers with forensic commitments presenting at State Psychiatric Hospitals has compressed the availability of civil beds." (p.10). The Plan recommends continuing this trend because of the increasing demand for forensic treatment. In thinking about the significance of the changing role of state psychiatric hospitals, the burden for indigent care is likely to increasingly fall upon local hospitals, a situation which forecasts increasing amounts of uncompensated care, which in the scenario outlined in Attachment A, leads to pressures on local taxing authorities to pay for increases in uncompensated care costs incurred by area hospitals.

Figure 6, which is based on indigent patients and is not related to the allocation of MHEC patients as are Figures 4 and 5, further elaborates MHEC's impact on area hospitals. As state psychiatric hospitals limit civil commitments, there is increasing pressure on community hospitals to care for indigent patients. This situation places even more significance on the role MHEC plays in the safety net for low-income residents. Its ability to quickly respond to and deescalate a mental health crisis can limit the need for not only an ER visit but also for a hospital admission. In looking at Figure 6, the trend for MHEC's treatment of indigent patients stands out showing its increasing importance in the treatment of indigent patients.



As discussed above, for indigent mental health ER visits, not only does the presence of MHEC in the area safety net enable hospitals to avoid costs but also when the patient is also indigent, the hospital avoids uncompensated care costs, (i.e., costs for which there is no payer).

Discussion/Summary

MHEC's patient population centers on SMI, low-income individuals in Burke's 12-county service area. Its presence in the area's healthcare safety net has a significant impact on the patient mix of area hospitals. This analysis estimates the impact by quantifying the cost avoided by hospital ERs and inpatient units. Making this estimate possible are several assumptions that are necessary to structure the study's methodology. Among the assumptions discussed previously, perhaps the most significant is comparability. That is, to what degree are the patients admitted to MHEC comparable to the patients treated by area hospitals in ERs and inpatient units? Is the severity of mental illness comparable? Would MHEC patients have length-of-stays equivalent to that experienced by hospital patients if they were admitted? Or, for ER visits, would MHEC patient charges be comparable to those of other individuals with a mental illness? Responding to these questions determines the study's methodology and the validity of the estimates of cost avoidance.

The initial impact of MHEC on a hospital is likely to be on the prevention of ER visits. In estimating ER cost avoidance, two analyses were conducted. The first looked at the cost avoidance associated with ER visits, and the second went beyond the ER cost, in itself, to assess the cost avoided for the entire visit of which ER costs are a subset.

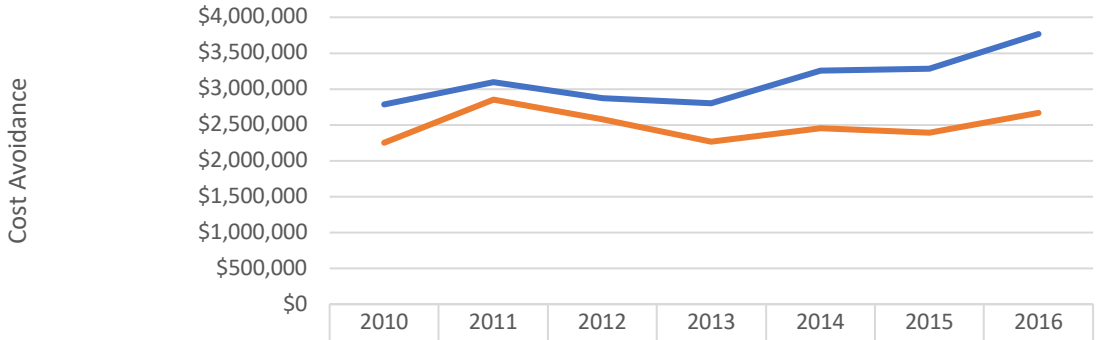
With the recognition that an ER visit can lead to a hospital admission, analyses were conducted on inpatient costs where the key question was concerned with the frequency of admissions to area hospitals. This question was addressed in two ways. The first modeled hospital admissions based on the premise that 50% of ER visits would lead to an admission (the 50% model in Figure 4). That is, if all

MHEC patients, in the absence of MHEC, would have accessed hospital ERs, 50% of these patients would have been admitted to the hospital.

The second model assumed that 100% of MHEC patients would be admitted to the hospital. The major assumption underlying this model is that MHEC's clinical practice of evaluating presenting patients suggests that if MHEC patients were to present in an ER (in the absence of MHEC), their clinical condition would lead to an admission. The results of this analysis are in Figure 5 and show that in 2016 MHEC-generated cost avoidance is estimated at $3.8 million across all area hospitals.

Because of the uncertainty as to what costs area hospitals would incur in the absence of MHEC, Figure 7 attempts to identify a range within which the total estimated cost avoidance might be expected. This figure creates a range by identifying an upper and lower boundary. The upper boundary is derived from the 100% model which shows growth in inpatient costs over time. The lower boundary is based on cost avoidance estimates in the 50% model. This model is a combination of the total visit cost avoidance (total costs for patients with an ER revenue code on the outpatient claim form), and inpatient avoided costs based on the 50% model's assumption. Under the assumption that all MHEC patients would visit the ER, but only 50% would be admitted, Figure 7 adds the total visit costs for MHEC patients assumed to be not admitted to the avoided costs for MHEC patients who were assumed to be admitted. That is, Figure 7 adds total visit costs to inpatient costs under the assumption that if a patient was admitted to the hospital, his or her ER-related costs would be included in the inpatient costs. Therefore, the only ER total visit costs that count towards cost avoidance are those for patients not admitted to the hospital.

Figure 7: Estimated Potential Cost Avoidance Based on Two Models



	2010	2011	2012	2013	2014	2015	2016
100% Hospital Admission	$2,784,707	$3,091,821	$2,871,911	$2,805,495	$3,255,752	$3,278,594	$3,766,671
50% Hospital Admission	$2,251,210	$2,852,098	$2,576,049	$2,265,597	$2,456,016	$2,393,263	$2,666,004

In 2010 estimated cost avoidance ranged between $2.3 million and $2.8 million. Over the years, the range widened to between $2.7 million and $3.8 million in 2016. While it is difficult to say with any certainty, but given the assumptions of this analysis, the best estimate of cost avoidance is likely closer to the lower bound in Figure 7 rather than the higher bound.

What can be stated with certainty is the significant role MHEC plays in providing care to low-income residents. Figures 2 and 6 align with Table 1B (in Attachment B) to reveal the significant impact MHEC has on area hospitals in preventing indigent ER visits and inpatient admissions. The prevention of ER

visits and admissions does more than generate cost avoidance; it also prevents the occurrence of costs for which there is no payment, that is, it enables hospitals to avoid uncompensated care (UC) costs.

Hospitals incur UC costs primarily under two conditions. The first is when state general revenue (GR) underfunds the Medicaid cost leading to a payment that is less than the hospital's cost. The second condition occurs when the patient has no form of payment and is indigent. In 2015, for example, Texas hospitals incurred over $7 billion in UC costs (see Attachment A for a detailed discussion).

Medicaid has two funding pools to help hospitals reduce their UC cost. In 2015 approximately $4 billion in supplemental payments from these two pools were made to hospitals. What is significant about these payments is that the state match required to draw the federal funds is paid by local taxpayers and not by state GR. This is where the cost avoidance created by MHEC becomes even more significant. Cost avoidance is the prevention of hospital costs. When these costs would have resulted from Medicaid or indigent patients, there is a prevention of UC costs as well. Preventing UC costs controls the growth in healthcare costs and ultimately, helps to control the burden on taxpayers to finance this care.

Payers of healthcare are continually striving for more efficient models of care to control the growth in cost. A major effort in healthcare which combines both cost control and enhanced quality is the movement towards best value in the purchase of healthcare services. Typically, the definition of best value is oriented towards the purchaser of care such as insurers for commercial insurance and the government for public coverage such as Medicaid. However, in Texas, with its "larger than any other state's" UC costs, one might reframe the best value question to focus on taxpayers. Controlling the growth in healthcare costs through innovation and enhanced quality will directly impact the need for additional tax dollars to support both the Medicaid and indigent healthcare programs in Texas. MHEC is an award-winning example of a best value model for delivering quality healthcare and controlling the growth in healthcare costs, as such it delivers the best value to the local taxpayer.

Attachment A

A Context for MHEC's Impact on Avoidable Costs: The Role of Uncompensated Care in Texas

Texas has been resolute in not implementing the Affordable Care Act's option for states to expand Medicaid to approximately one million low-income uninsured adults. Not expanding Medicaid to childless, adult Texans has significance in several areas, with two major ones being the impact on the state and local economies that result from the 90/10 federal matching requirements that pays for the expansion.[11] The second area involves the impact on unfunded healthcare, in particular, the impact on hospitals who experience a significant amount of uncompensated care each year.

In 2015 for example, Texas hospitals incurred over $7.5 billion in uncompensated care cost. Uncompensated care (UC) which is a Medicaid concept that is primarily applicable to hospitals, has two major components. There are UC costs resulting from hospitals being underpaid for the care they provide to Medicaid patients.[12] This component of UC is called the Medicaid Shortfall and in 2015 composed $2.4 billion of the total UC cost. The second major component of UC comes from hospitals providing care to uninsured Texans who have no or little healthcare coverage. In 2015 the cost incurred by hospitals for treating uninsured patients (i.e., indigent Texans) was approximately $5.1 billion.

Texas helps to offset a portion of the UC cost through the provision of supplemental payments made to hospitals each year under the authority of Texas' 1115 Medicaid waiver which is negotiated and managed by the Texas Health and Human Services Commission (HHSC). There are two major funding pools which pay hospitals based on a proportional allocation methodology, the ultimate result of which is a lump sum payment to hospitals that only partially covers the unpaid portion of their Medicaid costs. The Disproportionate Share Hospital (DSH) Pool is funded with approximately $1.8 billion while the UC Pool has $3.1 billion. After allocation to Texas hospitals from these pools, in 2015 there remained approximately $3.2 billion in unreimbursed UC incurred by Texas hospitals. In Texas UC costs are

[11] The Medicaid program is a partnership between the federal government (represented by the Centers for Medicare and Medicaid Services (CMS) and the state. One expression of the partnership is in how the state Medicaid program is funded. Medicaid funding is a shared relationship between the two partners, which for Texas means that, in general, Texas must pay 42% of the Medicaid program's cost while the federal government funds 58%. The expansion of Medicaid made possible under the Affordable Care Act seeks to motivate states to expand their Medicaid program by changing the funding relationship to a 90% federal match and 10% for the state. Hamilton's *Expanding Medicaid in Texas: Smart, Affordable and Fair* (January 2013) estimates the potential economic impact on Texas communities of the increased federal funding flowing into Texas from the 90/10 match as well as in the reduction in hospital costs.
http://www.mhm.org/images/stories/advocacy_and_public_policy/Smart%20Affordable%20and%20Fair_FNL_FULL.pdf

[12] Uncompensated care associated with hospitals being underpaid for the cost they incur for treating Medicaid patients in Texas represents a form of cost shifting from the state to the local community. Funding for hospital care in the Medicaid program is primarily done with General Revenue (GR) with funds allocated by the state legislature. When the state develops its two-year budget, it typically underfunds hospital care resulting in the Texas Health and Human Services Commission (HHSC) underpaying hospitals for inpatient care to Medicaid beneficiaries. Cost shifting enters into this payment relationship because the Medicaid program allows hospitals to receive supplemental payments through two Medicaid pools – the Disproportionate Share Hospitals Pool (DSH) and the Uncompensated Care Pool. While hospitals can earn additional payments from these two pools for the portion of cost they did not received in their initial GR-funded payment, the state match requirement that is required for CMS to provide funds comes from local tax dollars and not state GR.

expected to increase as the number of Medicaid beneficiaries grow and the number of indigent Texans increase.

While pool funding is substantial, it is insufficient. There are two major aspects of funding in these two pools that are relevant to the future payment for UC in Texas. The first concerns the need for Texas to provide matching funds to draw federal funding. While the matching rate varies each year in Texas, it is approximately 42% of the total Medicaid cost with the federal government providing the other 58%. The 42% of the cost required to earn federal funding to pay hospitals from these two pools comes from local tax dollars; virtually no state dollars (i.e., GR) are used in these two pools.

Secondly, in December 2017 CMS finalized negotiations on Texas' 1115 waiver extension to add another five years. During these negotiations, CMS took the position that it wanted to limit federal funding going into the Texas UC Pool, which funds care for indigent Texans, since, in CMS' thinking, there is a more viable alternative payment mechanism available for indigent care which, for Texas, is to expand Medicaid. Of course, Texas has steadfastly refused to expand Medicaid, a decision that continues to place the burden of funding care for expansion-eligible-Texans on local taxpayers. The measures in Table 1 characterize the population within Burke's service area as relatively poor and uninsured suggesting a continuing burden on county residents to pay for indigent care.

Table 1: Selected Demographic Characteristics for Burke Counties[13]

	2016 per Capita Income	2016 Percent Poverty	2016 Percent Uninsured
Texas	$27,829	14.7%	19.3%
Burke Service Area Counties			
Angelina	$21,486	26.7%	18.9%
Houston	$17,624	22.1%	15.8%
Jasper	$21,116	19.2%	18.8%
Nacogdoches	$21,343	25.4%	21.1%
Newton	$19,293	22.8%	17.8%
Polk	$21,441	20.3%	19.4%
Sabine	$20,120	29.7%	22.1%
San Augustine	$19,251	38,7%	21.3%
San Jacinto	$22,563	26.7%	19.7%
Shelby	$20,233	30.8%	24.8%
Trinity	$19,661	20.1%	19.7%
Tyler	$20,720	18.4%	16.1%

[13] US Census Bureau America's Fact Finder Selected Economic Characteristics 2012-2016 American Community Survey 5-Year Estimates. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_DP03&prodType=table

Attachment B: Selected Workload Measures for Burke's Mental Health Emergency Clinic (MHEC)

Table B1: Selective Mental Health Emergency Center (MHEC) Workload Measures

	Payer Source					Discharges					Bed Days	Admissions	Length of Stay
Year	Medicaid	Medicare	Medicare & Medicaid	No Payer (Indigent)	Private Insurance	Burke Outpatient	Inpatient Admission State or Private	Substance Abuse Services	Non-Burke Community Resources	No Referral	Total Bed Days	Total Admissions	Average Length of Stay
2018	204	20	39	770	82	889	171	49	118	63	3891	1115	3
2017	214	54	58	857	83	867	158	80	109	53	4313	1266	3
2016	236	44	65	894	91	913	188	459	95	66	3740	1330	3
2015	202	59	72	732	118	839	198	507	113	24	3002	1183	3
2014	283	47	85	712	75	797	204	244	135	35	3264	1202	3
2013	249	31	78	511	94	704	140	228	95	31	3878	963	4
2012	220	41	86	394	155	400	121	269	93	40	3656	896	4
2011	242	54	100	543	71	456	124	213	76	29	3433	1046	3
2010	248	118		597	41	676	133	253	107	17		1003	3
2009	235	86		332	27	560	70	163	53	16		673	3

Attachment C: Area Hospitals

Table C1: 'Area Hospitals'	
Hospital	**Thcic_Id**
Rusk State Hospital	107
North Texas State Hospital-Vernon	113
Harris County Psychiatric Center	115
CHRISTUS Jasper Memorial Hospital	38001
Memorial Medical Center-San Augustine	72000
Montgomery County Mental Health Treatment Facility	100087
Audubon Behavioral Healthcare of Lufkin	107100
Methodist Hospital	124000
Memorial Medical Center East Texas	129000
East Texas Medical Center-Crockett	185000
East Texas Medical Center-Trinity	287000
Bayshore Medical Center	349001
Nacogdoches Medical Center	392000
Medical Center-Southeast Texas	464002
Memorial Medical Center-Livingston	466000
Nacogdoches Memorial Hospital	478000
Woodland Heights Medical Center	481000
Sabine County Hospital	522000
Tyler County Hospital	569000
Palestine Regional Medical Center	629001
Cypress Creek Hospital	744001
West Oaks Hospital	755001
IntraCare Medical Center Hospital	762001
Intracare North Hospital	782001
Kingwood Pines Hospital	818600
St Joseph Medical Center	838600
Shelby Regional Medical Center	860500
Aspire Hospital	915000
Behavioral Hospital Longview	944000
Westbury Community Hospital	956000
Behavioral Hospital-Bellaire	969200
Cambridge Hospital	971700
Oceans Behavioral Hospital of Lufkin	973420
Rock Prairie Behavioral Health	973830
Hopebridge Hospital	974280
Houston County Medical Center	974710

Notes:

Over the years reviewed in this analysis hospitals can change names, merge or close. Hospitals can submit claims using one name (which in some cases varied by year) and file their Medicare cost reports using another name. This can occur for any of several reasons. Some hospitals filed their cost report but provided incomplete cost or charge data in some years making the calculation of a RCC not possible.