The Effect of the Texas Medicaid Waiver Design and Implementation on Regional Changes in Uncompensated Care: Part 2

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ABSTRACT

The 1115 Medicaid Waiver is an alternative payment methodology that many states have adopted in an effort to redesign their states' delivery system and not expand Medicaid. This research evaluates the effect of Texas Medicaid Waiver on reducing hospital uncompensated care percentage (UCP) within 20 geographic regions (RHPs) across Texas, while controlling for differences due to hospital characteristics and Waiver funding. Descriptive statistics were used to better understand differences in RHPs. A mixed-effects model was used to estimate changes in UCP between June 2012 and July 2016 at the RHP level. Independent variables included Fiscal Year, Beds, Underfunded Patient Mix, and Waiver funding amounts. The results show RHPs vary significantly in Medicaid and uninsured rates, number of Waiver projects deployed, and the valuation thereof. Differences across RHPs in UCP suggest varied results of the Waiver at reducing UCP, with five RHPs experiencing statistically significant decreases and 11 RHPs experiencing statistically significant, but small (<0.077%), increases. Three RHPs with the highest rates of Medicaid and uninsured showed decreases in UCP suggesting RHPs with the largest room for improvement had the greatest benefit. Overall, these results indicate the Waiver impact differs across geographical regions. Future research is needed to understand if the variation is due to the types of Waiver projects, the target population of the Waiver projects, and/or other market level characteristics.

Keywords: Medicaid Waiver, Hospital Uncompensated Care, Regional Healthcare Partnership

INTRODUCTION

Texas experienced a tripling rate of uncompensated care (UC) costs between 2002 and 2011 with costs increasing from $2.0 billion to $6.2 billion (Health and Human Services Commission, 2016). This annual UC growth rate of 13.4% contributed to Texas having the highest amount of UC as a percentage of total revenue among the seven most populous states in the country (Texas Department of State Health Services, 2013; Texas Health and Human Services Commission, 2016a). In 2011, Texas implemented an 1115 Medicaid Waiver after not expanding its Medicaid program under the Affordable Care Act. By 2013 annual growth rates in UC costs had decreased (2% per year for the 2011-2013 period), but still reached a considerably high level of $6.5 billion (Texas Health and Human Services Commission, 2016b). In contrast, research showed Medicaid expansion states had a $5 billion decrease in UC between 2013 and 2014, while the UC in non-expansion states remained roughly the same (Cunningham, Rudowitz, Young, Garfield, & Foutz, 2016).

Related research reported in the Journal of Health Care Finance suggested the early years of the Texas Medicaid Waiver showed evidence that UC, as a percentage of net patient revenues, decreased through funding of Delivery System Reform Incentive Payment (DSRIP) initiatives, which is a subset of the Texas Medicaid Waiver (Revere et al., 2018). Yet, other studies indicate mixed results in terms of improved health indicators for the Texas population (Deam, 2017). Under this scenario, there is still need for research to evaluate the broad impact of state waivers in terms of uncompensated care and improved health. It is also important to provide evidence on the overall effect of the Waiver program in Texas to complement the evidence from other states (Pourat, 2017; Roby et al., 2018). This study builds on prior research (Revere et al., 2018) and explores changes in UC percentage across 20 different regions in Texas.

Texas Section 1115 Medicaid Waiver Design

The 1115 Texas Medicaid Waiver (Waiver) allowed states to design a state-specific program aimed at increasing the provision of care for the low-income and uninsured population (Musumeci & Rudowitz, 2015). In Texas, a five-year waiver began in 2011, and was extended for one additional year. It was renewed in 2017 with significant redesign, for another five years. The Texas Waiver replaces the Upper Payment Limit (UPL) with a Delivery System Reform Incentive Payment (DSRIP) program aimed at transforming the delivery system, improving the quality of healthcare, and improving population health (Gates, Rudowitz, & Guyer, 2014). Texas received $29 billion in total Waiver funding between 2011 and 2016 and is budgeted to receive $24.8 billion between 2017 and 2022. Of this, Texas will receive approximately $3.1 billion in DSRIP specific funds between 2017 and 2019, $2.9 billion in 2020, $2.49 billion in 2021 and $0 in 2022 (Department of Health and Human Services, 2017). The intent of tapering the DSRIP funds is to create a self-sustaining healthcare delivery system.

The initial Waiver comprised 1,451 demonstration projects, implemented across 20 regions (regional healthcare partnerships or RHPs). The RHPs were created to facilitate effective delivery of care and collaboration among the providers implementing waiver projects (Figure 1). Each RHP is led by an anchor, which is a public hospital or local government entity that coordinates RHP activities and serves as the RHP's point of contact with the state and CMS (Gates et al., 2014). During the first year of the Waiver, RHPs developed DSRIP-related plans

that included a community health needs assessment and a list of innovative delivery projects with milestones selected from a CMS-approved menu. The following years of the Waiver involved implementation, assessment and improvement of projects in demonstration years 2 to 5 (Schoenberg, Chau, Salsberry, & Miller, 2013; Texas HHSC, 2016a, 2016b). The Waiver period consisted of five 12-month demonstration periods, ranging from October 1 to September 30 of each year. DSRIP projects consisted of four categories: infrastructure development, program innovation and redesign, quality improvement measures, and population health improvement metrics (Gates et al., 2014). RHPs received DSRIP funding based on 1) the percentage of the state population with incomes below 200% of the federal poverty level, 2) the percentage of acute care payments made to the region in fiscal year 2011, and 3) the percentage of supplemental payments (relative to the total) made under the Upper Payment Limit program to RHP providers in fiscal year 2011 (Texas Health and Humna Services Commission, 2012).

Figure 1: Regional Healthcare Partnerships (RHPs) in Texas
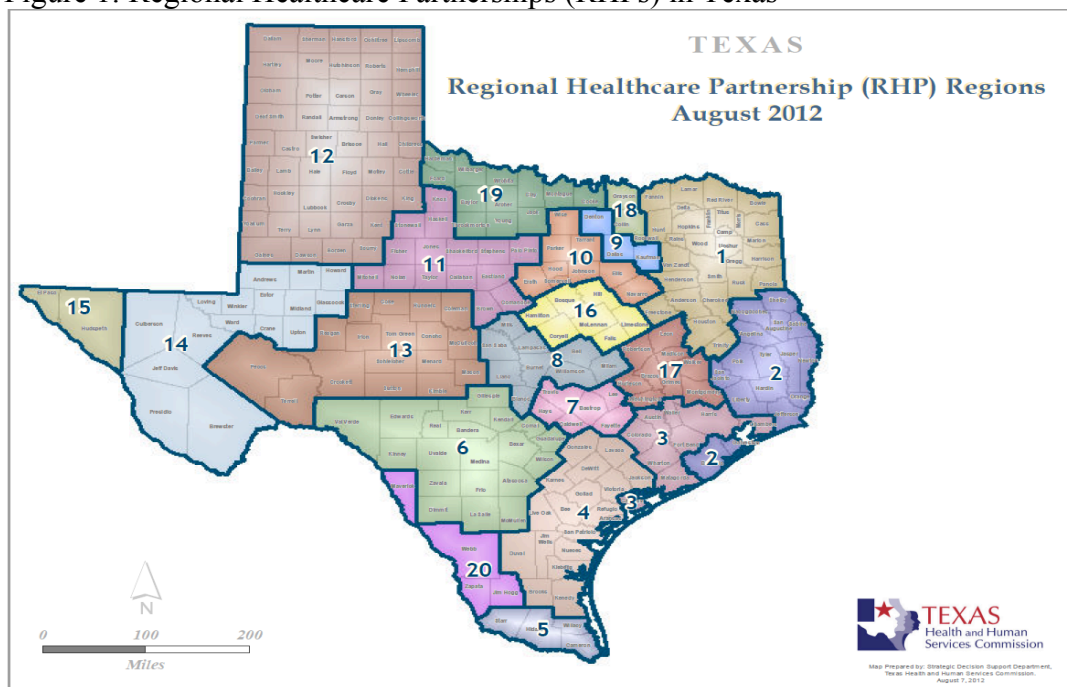
Stakeholders have become increasingly interested in evaluating the impact of state waivers at reducing UC and improving population health (Guyer, Shine, Rudowitz, & Gates, 2015). Due to the diversity of projects and geographic differences among regions, it is challenging to both evaluate the impact of the DSRIP program and understand the drivers of success. Although prior research on the Wavier evaluated changes in hospital UC percentages, evaluation at the regional level was not considered (Revere et al., 2018). This study expands the prior Waiver research, as well as other research that evaluated multiple factors impacting UC (Antonisse, Garfield, Rudowitz, & Artiga, 2017). The present study explores the relationship between the Waiver funding and changes in hospital UC costs by RHP.

Research Aim

This study furthers the prior research by Revere et al. (2018) by assessing changes in UC percentages across 20 geographic RHPs in Texas between 2012 and 2016. Specific objectives include: 1) exploring differences in RHP's with respect to the number of Waiver projects, the total valuation of Waiver projects and population characteristics, and 2) analyzing changes in UC percentage at the RHP level, while controlling for two DSRIP funding rate variables (Category 1 and 2 payments and Category 3 payments) and hospital-specific characteristics.

METHODS

American Hospital Association financial data for July 2012 to June 2016 were used to analyze Texas hospitals. Exclusions among the 610 reporting hospitals were made for hospitals with fewer than 25 beds due to their potential critical access status and economy of scale issues. Further exclusions were military and specialty facilities, as well as those that had failed to report for all study time periods. Uncompensated care percentage (UCP) was the dependent variable and was computed by dividing UC cost by net patient revenues. Finally, hospitals with UCPs that were not within the 0% to 100% range were excluded, as the data were not credible. The final analysis included 214 non-federal, acute care hospitals, providing 856 observations over a 4-year study period.

The study hospitals were categorized into RHP's based on zip code data from the Texas Health and Human Services Commission (Khalsa & Scott, 2016). Data on RHP population characteristics were obtained from the US Census Bureau (2015), while data on Waiver projects and valuation were gathered from the Texas Health and Human Services website (2017). These RHP level data were described to obtain a better understanding of the population and project variation across RHPs. In addition, each RHP's Medicaid/ uninsured population size was used to adjust the waiver funding variables to a per-person level.

To achieve aim 1, descriptive statistics at the RHP level were summarized to better understand differences among RHPs. Variation in the number of Waiver projects and the DSRIP valuation of the RHP's projects provide an in-depth assessment of the potential impact of the Waiver at the RHP level. The DSRIP valuation data were broken down into two categories, one representing funding for building infrastructure (Category 1 and 2) and the second representing funding for achieving health and/or service outcomes (Category 3). RHP level population data on the percent of individuals with Medicaid or uninsured were included because this is the target population for DSRIP funding.

To achieve aim 2, a mixed-effects model was used and the results interpreted. Table 1 defines the dependent and independent variables. The RHP funding rate from October 2011 to September 2015 was used to assess its association with UCP in the following year. In the model, Waiver funding from the first study year was used to estimate the effect on the subsequent year's UCP, the pattern of which was replicated for the remaining years. Lagging these variables was done because it was presumed that the effect of Waiver-funded activities would not be realized in the UCP for at least 6 months. The fiscal year for each RHP funding was October 1 through September 30, with FY-0 in this study representing October 1 2011 to September 30, 2012.

The analysis on UCP change in hospitals is for the period July 2012 to June 2016. Thus, FY-0 for hospitals is July 1 2012 to June 30 2013.

Table 1. Definitions of dependent and independent variables

Variables	Definition
UCP per RHP (i,j)	Total uncompensated care costs/total net patient revenues.
Fiscal year (i)	2013 = 0, 2014 = 1, 2015 = 2, 2016 = 3
Beds	Number of beds in services, adults and pediatrics for each hospital
Underfunded Mix (i,j)	Sum of Gross Medicaid charges, total charges for state and local indigent care program, and charges of SCHIP divided by total charges in RHP
Category 1and 2 earned amount by RHP standardized	Total amount of categories 1 and 2 paid to the RHP divided by the Medicaid/Uninsured population in the RHP for the prior year
Category 3 earned amount by RHP standardized	Total amount of category 3 paid to the RHP divided by the Medicaid/Uninsured population in the RHP for the prior year
RHP (j)	Dummy variables for 20 RHPs (RHP 3 was omitted as the reference group)
Interactions	Dummy variables for each RHP* Fiscal year (RHP 3 was omitted as the reference group)

A three-level mixed-effects model, containing both fixed and random effects, was used in the analysis, given the repeated measurements over time (Dunn & Chen, 1994). The research model hierarchically contains independent variables from three levels: 1) fiscal year (i); 2) hospital level (bed size); and 3) RHP level (j). These variables include one-year lagged adjusted paid amounts (combined Categories 1 and 2 and Category 3) for each RHP, underfunded payer mix, 19 RHP dummy variables, where RHP 3 serves as the reference, and 19 interaction terms for RHP with Fiscal Year. RHP 3 was selected as the base because it has the largest population and the largest number of projects and providers. RHP 3, which represents the Houston region, had more than 290 providers and 177 projects. The research model is similar to the 2015 study by Chen et al, which evaluated changes in UC costs using hospital financial data and a fixed effects model to control for covariates. All statistical analyses were performed with Statistical Analysis System software (Version 9.4; SAS Institute, Cary, North Carolina).

The research model was:
$UCP_{ij} = \beta_0 + \beta_1 Fiscal\ Year_i + \beta_2 Beds + \beta_3 Underfunded\ Mix_{ij} + \beta_4 Category\ 1\ and\ 2_j + \beta_5 Category\ 3_j + \beta_6 RHP1 + \beta_7 RHP2 + \ldots + \beta_{23} RHP19 + \beta_{24} RHP20 + \beta_{25} (Fiscal\ Year_i\ x\ RHP_1) + \beta_{26} (Fiscal\ Year_i\ x\ RHP_2) + \ldots + \beta_{43} (Fiscal\ Year_i\ x\ RHP_{20})$

Changes in UCP were estimated while controlling for the previously identified covariates measured at the hospital level (Bed Size) or RHP level (i.e., Underfunded Mix, RHP Lagged Funding Rate and RHP).

RESULTS

The first objective of this research sought to describe variation in RHP waiver projects, funding, and population characteristics across Texas. Texas has 20 RHPs serving over 25 million individuals, of which approximately 35% are Medicaid or uninsured individuals. Table 2 describes each RHP's population, using 2015 census data, and the quantity and valuation of the DSRIP projects over the entire 5-year term. RHPs range from having 22% to 66% Medicaid or uninsured population, with RHP 18 being the lowest and RHP 5 the highest. RHP 3 represents over 2 million individuals with 42% of these on Medicaid or uninsured. Given this, it is not surprising that RHP 3 has the highest number of projects (177) and total valuation (>$2 billion). RHP 9 is the second largest RHP with over one million individuals and 41% on Medicaid or uninsured. This RHP has 129 projects valued at over $1.2 billion. Interestingly, RHP 5 has the highest rate of Medicaid and uninsured (66%) and serves a large population (848,397) yet it only houses 78 projects with $580 million in valuation. The variation in RHP population size, Medicaid or uninsured rates, projects and valuation is tremendous.

Table 2: RHP Level Characteristics

	no. of projects	Cat 1-2 Value	Cat 3 Value	Total Medicaid & Uninsured	Value per Medicaid & Uninsured	% Medicaid & Uninsured
5	78	$476,640,767	$104,682,933	848,397	$685	66%
20	24	$68,985,615	$17,835,345	209,328	$415	63%
15	60	$384,040,711	$83,832,627	412,189	$1,135	51%
3	177	$1,642,770,212	$379,149,906	2,120,979	$953	42%
9	129	$1,065,638,291	$267,036,627	1,315,485	$1,013	41%
4	88	$310,128,041	$92,046,548	300,671	$1,338	40%
11	43	$93,802,544	$23,154,868	115,611	$1,012	39%
1	91	$316,543,723	$72,384,654	481,596	$808	38%
14	56	$190,730,542	$49,197,239	151,333	$1,585	38%
13	38	$60,188,246	$13,643,948	68,083	$1,084	37%
6	124	$834,810,112	$182,503,096	893,117	$1,139	37%
12	99	$314,358,694	$65,623,972	327,363	$1,161	37%
2	83	$284,239,833	$60,936,119	498,953	$692	36%
16	34	$115,816,939	$25,018,982	138,675	$1,016	35%
19	35	$66,362,387	$20,456,220	85,055	$1,021	35%
10	125	$820,553,739	$181,095,402	874,618	$1,145	35%
7	76	$494,624,292	$136,059,364	458,652	$1,375	33%
17	28	$61,555,410	$13,006,684	253,608	$294	30%
8	40	$86,433,587	$14,465,192	239,072	$422	27%
18	23	$95,408,769	$18,847,072	231,026	$495	22%
Total	**1451**	**$7,783,632,454**	**$1,820,976,798**	**10023811**	**$958**	**34.6%**

The second research question aims to understand changes in UCP at the RHP level across the study years. A mixed-effects model, which includes RHP level variables and two non-interacted lagged payments (Category 1 and 2 and Category 3), was performed (Table 3). The first variable, Fiscal Year, was significant with a p-value less than 0.0001. Fiscal Year indicates the annual change to UCP per year. However, since RHPs are represented by dummy variables, Fiscal Year was the specific annual effect for RHP 3, the base RHP. Thus, the Fiscal Year estimate represents the annual change for RHP 3 and suggests that for every study year UCP increases by 0.00642 percentage points. To calculate the Fiscal Year effect for the other RHPs requires including the interaction effects, which is discussed later in this paper.

Table 3. Solution for Fixed Effects (Population level parameter estimates)

Variables	Estimate	SE	p value
Intercept	0.04084	0.0072	.
Fiscal Year	0.00642	0.0015	<0.0001
Beds	-7.1E-08	1.8E-06	0.9688
Underfunded Mix	0.06627	0.0084	0.9367
Funding rate categories 1 and 2	0.00002	9.36E-06	0.0296
Funding rate category 3	-0.00098	0.0001	<0.0001
RHP 1	-0.01376	0.0088	0.1189
RHP 2	0.03003	0.0089	0.0008
RHP 4	0.05731	0.0089	<0.0001
RHP 5	-0.04119	0.0114	0.0003
RHP 6	0.03446	0.0092	0.0002
RHP 7	0.01401	0.0089	0.1174
RHP 8	-0.00206	0.0093	0.8250
RHP 9	0.06140	0.0089	<0.0001
RHP 10	0.03419	0.0088	0.0001
RHP 11	-0.01748	0.0090	0.0517
RHP 12	0.02108	0.0088	0.0174
RHP 13	-0.00252	0.0096	0.7932
RHP_14	0.03562	0.0092	0.0001
RHP 15	-0.07124	0.0101	<0.0001
RHP 16	0.04589	0.0091	<0.0001
RHP 17	-0.02166	0.0093	0.0195
RHP 18	-0.00996	0.0091	0.2716
RHP 19	0.05803	0.0091	<0.0001
RHP 20	-0.05963	0.0102	<0.0001
Fiscal Year * RHP 1	-0.00075	0.0012	0.5456
Fiscal Year * RHP 2	0.00405	0.0014	0.0034
Fiscal Year * RHP 4	0.00293	0.0020	0.1493

Fiscal Year * RHP 5	-0.00178	0.0017	0.3070
Fiscal Year * RHP 6	-0.00746	0.0014	<0.0001
Fiscal Year * RHP 7	0.00781	0.0021	0.0002
Fiscal Year * RHP 8	0.00569	0.0019	0.0034
Fiscal Year * RHP 9	0.00943	0.0013	<0.0001
Fiscal Year * RHP 10	0.00577	0.0013	<0.0001
Fiscal Year * RHP 11	0.01026	0.0016	<0.0001
Fiscal Year * RHP 12	0.00203	0.0013	0.1287
Fiscal Year * RHP 13	0.01258	0.0024	<0.0001
Fiscal Year * RHP 14	0.01376	0.0025	<0.0001
Fiscal Year * RHP 15	-0.00050	0.0020	<0.0001
Fiscal Year * RHP 16	0.00160	0.0018	0.3684
Fiscal Year * RHP 17	-0.00386	0.0021	0.0631
Fiscal Year * RHP 18	-0.00054	0.0015	0.7270
Fiscal Year * RHP 19	-0.00003	0.0019	0.9888
Fiscal Year * RHP 20	-0.00389	0.0026	0.1303

The estimated effect of the first control variable, total beds in a hospital, is -0.00000007 (p=0.9688). It was used as a control factor and is not significant. The variable Underfunded Mix represents the percentage of gross charges attributed to those payers typically associated with decreases in UCP (e.g., Medicaid). Since the estimate's effect is not statistically significant (p=0.9367), changing the underfunded mix of an RHP is not associated with UCP changes. However, this variable is similar to that of Beds in that it is included for control.

The last two control factors are the lagged payment variables (combined Categories 1 and 2 payments and Category 3 payments) on the mixed-effects model. These two RHP funding rate variables represent the funds received in one year per Medicaid or uninsured person that were earned in the previous year. In the studied data set, the minimum funding rate of Categories 1 and 2 received by any RHP was $59.37 per Medicaid or uninsured population, with the maximum amount received in any one year being $326.42 per Medicaid or uninsured population. For funding rate Category 3, the minimum amount received in any one year was $8.56 per Medicaid or uninsured population and the maximum was $138.38. These two variables are included solely for control. A prior analysis found that Categories 1 and 2 were not associated with significant changes in UCP, whereas Category 3 payments were associated with a significant reduction in UCP (Revere et al., 2018).

To further analyze changes in RHP-level UCP occurring across Texas, the coefficients of the RHP, Fiscal Year, and the interaction of the two variables, were explored. Table 4 provides the net Fiscal Year effect for every RHP by year between 2012 and 2016 and average annual UCP change by RHP. The calculations were made using the mixed model coefficients for Fiscal Year, RHP, and the interactions for Fiscal Year and RHP, while holding all other variables fixed. The average annual change for RHP 3, the base level RHP, is shown first for comparison reasons.

The findings for RHP 3 suggest that for each year of the study, the UCP was increasing by 0.00642 percentage points.

Evaluation of the RHP variables finds a statistically significant increase in the base level, RHP 3. When RHP is interacted with Fiscal Year, five RHPs had a statistically significant average decrease over time, suggesting favorable results from the Waiver within these RHPs. All other RHPs experienced positive UCP growth rates over time. RHP 1 and 18 showed non-significant changes, suggesting their UCP increased at the same rate as RHP 3. Among the 12 with a statistically significant increase in UCP, the rate of increase in eight of the RHPs was less than 0.035%, indicating the Waiver may have slowed the annual growth rate. Although the rates for all other RHPs were statistically significant, the changes are small in magnitude with the highest being RHP 9 at 0.077%.

Table 4. Net Effects of Mixed Model Analysis due to Fiscal Year and RHP Changes on UCP, holding all other Variables Constant.

RHP	Average Annual Growth Rate	Trend Direction
3*	**0.006420**	**Increase**
1	0.019432	Increase[NS]
2	0.040504	Increase[1]
4	0.066663	Increase[2]
5	-0.036550	Decrease[2]
6	0.033422	Increase[1]
7	0.028241	Increase[1]
8	0.010054	Increase[1]
9	0.077247	Increase[1]
10	0.046380	Increase[1]
11	-0.000800	Decrease[2]
12	0.029536	Increase[1]
13	0.016482	Increase[1]
14	0.055802	Increase[1]
15	-0.065320	Decrease[2]
16	0.053915	Increase[2]
17	-0.019100	Decrease[1]
18	-0.004080	Decrease[NS]
19	0.064422	Increase[1]
20	-0.057100	Decrease[1]

*base level
[1] Statistically significant interaction
[2] Main effects only statistically significant
[NS] Non significant finding; therefore annual growth rate equals that of RHP 3

DISCUSSION
The 1115 Medicaid Waiver is an alternative payment methodology that many states have adopted in an effort to redesign their states' delivery system. In Texas, the Waiver was intended

to achieve the three goals of the Triple Aim: improve the health of Texans, increase satisfaction with healthcare services, and contain costs. Medicaid, low-income and uninsured individuals were the target population, although the effects of Waiver activities may also benefit insured individuals.

Prior research, using the same data analyzed in this study, found the overall rate of UCP change increased annually in Texas during the studied 4-year waiver period (Revere et al., 2018). The researchers further noted that Category 1 and 2 payments, aimed at building infrastructure, were not statistically significant, but that Category 3 funding, aimed at outcomes, was significant. The present study furthers the knowledge base by evaluating the effect of Waiver within the 20 RHPs across Texas while controlling for differences due to Category funding. The RHPs in Texas vary significantly not only in Medicaid and uninsured rates, but also in the number of Waiver projects deployed and the valuation thereof. The differences across RHPs are also seen in UCP. In fact, at the RHP level, the data suggest mixed results of the Waiver at reducing UCP. Five RHPs were estimated to have experienced significantly significant decreases in UCP over time (5, 11, 15, 17, and 20). Interestingly, RHPs 5, 15, and 20 have the highest rates of Medicaid or uninsured, which is the target population for the Waiver overall. It is likely that these RHPs with the greatest gains were also those with the largest opportunity for improvement. All other RHPs, showed increases in UCP over the 4-year study period, although the growth was relatively small in magnitude (<0.077%). These results suggest the Waiver impact differs across geographical regions; however, more research is needed to understand if the variation may be attributed to the types of Waiver projects within each region, the community and target population of the Waiver projects, and/or other market level characteristics.

This study has the same limitations as the precursor study (Revere et al., 2018) in that it is limited to the Texas 1115 Waiver, AHA data were self-reported, and the fiscal year for hospital reporting is not directly contiguous with DSRIP funding years.

CONCLUSIONS
Financing hospital care for the uninsured is a national, state and local policy concern. Providers have relied on disproportionate share payments and other forms of financing, such as Medicaid Waivers, to offset costs of care for the uninsured. This is particularly true in states, such as Texas, which has a high rate of uninsured. The 1115 Texas Medicaid Waiver, now in its seventh year, provides Texas with a funding stream for innovative projects aimed at increasing access and reducing uncompensated care. Policy leaders are looking for evidence that the Waiver enhances access, contains costs, and improves outcomes. The results of this study show the impact of the Waiver on reducing UCP varies across geographic regions in Texas. These results are not surprising given the variation in both populations and Waiver projects across Texas' 20 RHPs. The results suggest that some regions, particularly those with extremely high levels of Medicaid and uninsured, are more effective at reducing UCP than others. Subsequent research will focus on differences in Waiver projects and outcomes between RHPs that have successfully reduced UCP and those that continue to have increases.

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