Evaluation of the 1115(a) Texas Demonstration Waiver - Healthcare Transformation and Quality Improvement

MAY 30, 2017

Final Evaluation Report

As Required by Special Terms and Conditions
Number 75(b)

Texas
Health and Human Services

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INTRODUCTION

This report presents the Final Evaluation findings and fulfills requirements in Number 75(b) of the Special Terms and Conditions (STCs) for Texas' Healthcare Transformation and Quality Improvement Program (Waiver Number: 11-W-00278/6) authorized under Section 1115(a) of the Social Security Act.

The Final Evaluation Report is organized around the eleven evaluation goals (EG) specified in Texas' approved Evaluation Plan (Appendix G). The Executive Summary and Overview provide a synopsis of the evaluation results. Appendices B through F provide detailed methods and results for each section of the evaluation, as follows: Appendix B: Evaluation Goals 1-4

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EXECUTIVE SUMMARY

In December 2011, Texas received approval for the 1115 Transformation Waiver (Demonstration) to increase access to healthcare, improve well-being, and reduce escalation of costs. This is the final report on results of the Demonstration. The Demonstration included:

> (1) expanding Medicaid managed care from regional to statewide coverage, through STAR, STAR+PLUS, and Children's Medicaid Dental Services;

> (2) shifting state and federal reimbursement to hospitals for uncompensated care from the previous Upper Payment Limit program to an Uncompensated Care pool, including changing from a focus on claims to costs incurred; and

> (3) creating an incentive pool, called the Delivery System Reform Incentive Payment (DSRIP) program for enhancing the state's health care infrastructure and innovative approaches to improving health care quality and health, while controlling costs. Through DSRIP, providers could earn payments for meeting reporting and performance metrics and milestones approved by Centers for Medicare and Medicaid Services (CMS) and Health and Human Services Commission (HHSC) for a wide range of innovative projects.

To facilitate the more collaborative regional health care envisioned within the Demonstration, each participating provider in UC and DSRIP was required to participate in one of 20 Regional Healthcare Partnerships (RHPs) created for this purpose. As a condition for approving the Demonstration, the CMS required evaluating the expansion of Medicaid managed care, the Demonstration's effect on collaboration within these RHPs; stakeholders' perceptions of Demonstration implementation and effectiveness; the effects of the DSRIP program on patient health care quality, health, and costs; and whether DSRIP projects affected uncompensated care.

In the CMS-approved Evaluation Plan, Evaluation Goals 1- 4 related to Medicaid managed care expansion; Evaluation Goal 5 focused on changes in uncompensated care; Goals 6-8 addressed the impact of DSRIP projects on health care quality, population health, and costs; Goal 9 related to how regional safety care structures changed through the Demonstration, and Goals 10-11 focused on stakeholder perceptions of the Demonstration. This report has been re-ordered to reflect the Demonstration's implicit theory of change, that Medicaid managed care would improve access and save money; stakeholder perceptions of Demonstration implementation could be used to inform subsequent improvements; DSRIP projects would improve health care quality, population health, and costs locally; and these impacts would collectively reduce the need for uncompensated care.

As Medicaid beneficiaries and healthcare benefits shifted to a managed care delivery model, managed care was associated with improvements in access, care coordination, and cost, while results were mixed for healthcare quality. The average overall number of connections (or ties) among providers within RHPs increased in the year of preparation for the Demonstration, and decreased over the next 2 years as providers recalibrated their cooperative efforts, ultimately resulting in a slight net increase over the duration of the Demonstration. The most frequent new

collaborations among providers related to formal data sharing, suggesting progress toward collective data analysis capacity. Despite significant start-up costs and continued administrative burden associated with the Demonstration, stakeholders perceived opportunities for innovation, strengthening public-private partnerships, and building accountability-related capacity.

Care navigation projects were selected as a prominent type of project for the evaluation of the DSRIP program. Quantitative analyses did not find evidence that the type of DSRIP project selected for analyses was associated with improved outcomes to date, but results did indicate a decrease in hospital encounters after receipt of care navigation. Furthermore, these analyses did identify a range of process and contextual factors that may improve future outcomes after a longer period of project implementation affects patients through long-term approaches to preventive care and management of chronic and complex diseases. In qualitative analyses, participants described a range of benefits from care navigation, largely related to improving patient experience. Statewide, the costs of uncompensated care continued to rise through the first year when DSRIP projects were becoming operational (Demonstration Year 2); however, lags in data availability preclude complete analyses of how DSRIP affected UC.

BACKGROUND: 1115 WAIVER DEMONSTRATION IN TEXAS 2011-2016

Section 1115 demonstration waivers (Demonstration) enable states to test project designs that depart from existing federal rules while remaining consistent with the overall goals of the Medicaid program. Texas' 1115(a) Medicaid Waiver directed anticipated savings from Medicaid managed care expansion to create the Delivery System Reform Incentive Payment (DSRIP) pool for projects designed to improve health care quality and health outcomes, as well as to contain costs. To build regional safety net health care capacity, Texas facilitated the development of 20 Regional Healthcare Partnerships (RHP). An anchor organization in each RHP worked with providers to identify DSRIP projects based largely on regional health needs and facilitated shared learning among DSRIP providers throughout the demonstration period. Hospitals, physician groups, health departments, and community mental health centers have earned DSRIP funds for meeting performance goals for approved projects. In total, approximately 1,500 3-year and 4-year DSRIP projects were approved, with a combined 5-year valuation exceeding $11 billion.

EFFECTS OF MEDICAID MANAGED CARE EXPANSION

Longitudinal analytic methods were used to evaluate the pre- and post-Demonstration statewide expansion of Medicaid managed care (MMC) and newly carved in benefits from federal fiscal year (FFY) 2009 through FFY 2015. Measures on short-term outcomes (process indicators), intermediate outcomes (health outcome indicators), and cost outcome indicators were selected to evaluate whether Medicaid managed care expansion was maintaining or improving health outcomes while containing cost growth. On average, by Service Delivery Area (SDA), MMC increased access to care and utilization for STAR and STAR+PLUS programs.

Although dental utilization continues to exceed national targets for access, there was an overall decrease in utilization for most dental measures since the expansion of dental managed care. However, preventive and diagnostic services remained the most frequently utilized services before and after expansion and children receiving at least one topical fluoride application did increase. The results indicate a focus on preventive care; and potentially more appropriate and efficient utilization of services as the service delivery model shifted from FFS to MMC.

Care coordination measures increased for STAR+PLUS clients for most SDAs as providers identified more ambulatory care clients as existing patients. Mental health rehabilitation services and targeted case management services showed a small, but statistically significant increase throughout the state versus the comparison SDA. To evaluate one potential impact of carving-in targeted case management services, the number of hospitalizations pre- and post- carve-in were reviewed; a decrease in hospitalizations was observed for members in STAR, STAR+PLUS, and NorthSTAR. However, Medicaid clients in STAR and STAR+PLUS who received targeted case management had a small statistically significant higher rate of hospitalizations and likelihood of hospitalization when compared to NorthSTAR clients.

MMC demonstrated minor improvements in quality of care with decreasing trends for potentially preventable hospitalizations for STAR and STAR+PLUS programs and mixed results for hospitalizations due to asthma or severe persistent mental illness diagnoses. Potentially preventable hospital readmissions saw a slight decrease in the majority of expansion SDAs. Results for potentially preventable emergency room visits were also mixed for STAR versus STAR+PLUS programs. The evaluation of cost outcomes showed that more money was returned to Texas under the Experience Rebate provision compared to the money that would have been returned under the Medical Loss Ratio regulations.

MMC expansion supported Demonstration goals by building a foundation for an integrated healthcare delivery system that incentivizes quality and efficiency and continues to make improvements in healthcare quality and outcomes for the Texas Medicaid population. Although MMC expansion statewide has made progress, the benefits offered continue to change, suggesting that further evaluation, especially for newly added populations and carve-in services, is warranted.

CHANGES IN COLLABORATION AMONG ORGANIZATIONS

Social network analysis was used to measure change in collaboration among organizations participating in DSRIP within each RHP. Collaboration was measured by assessing connections between providers in each RHP; ties between providers were measured for program and service delivery, sharing tangible resources, and formal data sharing.

On average across Texas, the number of cooperative ties within RHPs as well as the concentration of cooperative activity among relatively few providers within RHPs increased slightly from the year prior to RHP formation to Demonstration Year 2, and decreased between Demonstration Years 2 and 4. Results varied considerably across the type of tie, as well as by RHP. The most common types of ties throughout the first few years of the Demonstration were for program delivery; these ties were also the most concentrated among relatively few providers.

The increases in service delivery collaboration in at least half of all RHPs for all types of cooperation indicate progress toward the Demonstration goal of promoting collaboration in order to transform the health service delivery system.

Additional findings indicate that collaboration for the purposes of formal data sharing, though less prevalent than other types of collaboration, experienced the greatest percentage increase over the Demonstration period. Beyond collaboration between organizations in the same sector, the evaluation also found an increase in intersectoral ties, particularly between community mental health centers and other types of organizations in the areas of tangible resource sharing and formal data sharing. An early surge of collaboration linked to organizations making their DSRIP projects fully operational eventually gave way to the pressure of meeting metrics and responding to required monitoring, which may have reduced the resources available for collaboration; organizations likely recalibrated their efforts to focus on meeting metrics in order to receive payments.

Finally, including organizations that traditionally were not a part of the health service delivery system fostered increased collaboration. However, the design of the Demonstration only allowed for a single performing provider to receive valuation-based payments; this may have disincentivized collaboration, as other eligible performing providers could obtain more resources doing their own project than by collaborating and receiving only fair market value of the services they provided.

STAKEHOLDERS' PERCEPTIONS AND RECOMMENDATIONS

Demonstration stakeholders were generally satisfied with how the program has been implemented and with their experiences during implementation, despite start-up issues. The most frequently identified strengths of the Demonstration include increases in available funding, the opportunity for innovation, the emphasis on public-private partnerships, and systems for accountability. Recommendations focus on streamlining processes, timelines, and payment schedules; eliminating frequent changes to policy; recognizing and addressing the unique implementation challenges of different types of providers; and including more provider types that were previously excluded.

DSRIP PROJECTS AND CARE NAVIGATION COMPARATIVE CASE STUDY

Approximately 1,500 DSRIP projects were approved and implemented to improve behavioral health, access to primary care, chronic care management, access to specialty care, and health promotion/disease prevention. With such project diversity, focus was given to care navigation (CN) because it reflects a DSRIP's goal to shift care to prevention, and increasing coordination among providers. This part of the evaluation was conducted as a longitudinal comparative case study that included 10 DSRIP CN projects related to emergency department use as well as 10 comparison providers that did not have these specific types of projects, and hence reflected usual practice for patients using EDs frequently. The 10 projects were chosen to yield a statewide sample based on a range of providers, i.e., included hospitals, emergency medical

services, and community health centers (Appendix E). Available data showed CN services decreased hospitalization encounters by 19% for clients receiving care navigation. Additionally, interviews with staff, patients, and family members revealed that DSRIP care navigation often entailed emotional, informational, and tangible support, as well as referrals to needed health and human services and help accessing those services. A range of specific care navigation processes and organizational resources were also quantitatively associated with positive outcomes, mostly in the realm of quality. The majority of DSRIP providers surpassed the number of individuals they planned to serve. In addition, DSRIP CN projects had been able to increase reliance to help their patients through a broader range of local health and human service providers by DY 5. However, rural providers in particular seemed challenged to implement these DSRIP projects, in part because of limited local resources. Finally, as of Demonstration Year 5 none of the 10 providers in the study had identified strategies for continuation at scale without continued DSRIP funding. This does not necessarily mean that DSRIP projects do not save money. However, these projects may not save money for the providers offering them.

EFFECTS ON UNCOMPENSATED CARE COSTS

The Demonstration replaced the previous Upper Payment Limit (UPL) with the UC Payment pool to reimburse providers for eligible Uncompensated Care (UC) costs. In addition, a new DSRIP payment pool was added with managed care savings to promote health system transformation. The goal of this part of the evaluation was to determine whether DSRIP had decreased UC costs during the Demonstration. Due to issues with availability of data, Texas uses 2-year lagged cost data to estimate UC cost for the year of payment. Data indicate UC costs increased from FY2010 (pre-DSRIP) to FY2013 (the first year of DSRIP projects becoming operational). However, given the timing of DSRIP program implementation under the Demonstration and the lag in UC data availability, more follow-up time is needed to measure the impact of the Demonstration on UC cost.

SUMMARY

The Demonstration has been a massive experiment in transforming health care. In expanding Medicaid managed care statewide as well as transitioning much of the funding historically allocated for uncompensated hospital care into an incentive payment pool, the state has transitioned to much more accountable uses of public dollars. This evaluation has documented resultant changes in the state's regional safety net structure as well as associations between a variety of processes and patient outcomes, primarily in health care quality. However, the level of organizational changes required to implement DSRIP projects and uncertainties about DSRIP reporting requirements and payment were also disruptive to many participating providers, especially during initial implementation, and for those in rural areas. Providers also seemed unsure even in the fifth year of the Demonstration about how to sustain DSRIP projects without continued DSRIP funding. The survey indicates that Demonstration stakeholders are generally satisfied with how the program has been implemented and with their experiences during implementation, despite start-up issues.

Overall, this evaluation detected local and regional changes in Texas' safety net during the Demonstration. Patients and providers also reported that one salient type of DSRIP project – care navigation - can improve patient experiences. Quantitative results from the comparative case study discussed in more detail in Appendix E found hospitalization encounters decreased among clients receiving CN services as compared to clients receiving standard of care. Additional quantitative results indicate specific navigational processes and contextual factors that were associated with better outcomes. In addition, qualitative reports from professionals, patients, and families indicate that DSRIP care navigation improved quality and health outcomes for many patients, as well as occasionally affecting service use patterns.

The evaluation assessed four distinct aspects of the Demonstration - expansion of MMC, collaboration among organizations within the newly formed RHPs, DSRIP, and UC - along with stakeholder perceptions of the Demonstration. Strengths of the evaluation include use of population data for MMC analysis; and for other aspects of the evaluation, state-wide sampling and inclusion of regional healthcare partnership providers and additional stakeholders, as well as local agency leadership, front line staff, and partner agencies, in addition to patients and families. Limitations derive from the challenges inherent in disentangling the effects of the Demonstration as a whole from concurrent changes, including implementation of the Affordable Care Act, and continuing changes in the Texas population. Additionally, the generality of the 10 DSRIP projects chosen for in-depth examination to DSRIP projects as a whole is unknown. However, findings such as the importance to patients of ready access to information about how to address their health needs, how staff can help develop such mutual understanding by developing care plans with patients, and how this type of communication with patients may in turn facilitate better coordination among providers, are applicable to a broad range of strategies to improve outcomes for patients with complex needs. Finally, the timeframe for various aspects of the evaluation allow for analysis of the pre-Demonstration period and early years post-Demonstration, but additional evaluation is needed to determine its continued impact on health care in Texas.

Based on these results, the Evaluation Team recommends that HHSC continues learning collaboratives as well as DSRIP projects that are meeting their specified goals, and retain among other project options those investing in sharing information among patients, providers, and other health and human services.

OVERVIEW:
EVALUATION OF THE 1115(A) TEXAS DEMONSTRATION WAIVER - HEALTHCARE TRANSFORMATION AND QUALITY IMPROVEMENT

EFFECTS OF MEDICAID MANAGED CARE EXPANSION

BACKGROUND FOR EVALUATION GOALS 1 – 4

Medicaid is a jointly funded state-federal program that finances health insurance for low-income individuals, pregnant women, children, disabled, and elderly Americans. Through the traditional payment healthcare model, known as fee-for-service (FFS), each state directly pays health care providers a fee for each unit of service provided. FFS can result in overutilization and lack of care coordination that may be harmful to beneficiaries and incur unnecessary costs (Chernew, 2010; Emanuel & Fuchs, 2008).

In 1993, Texas began reforming the Medicaid payment structure through the State of Texas Access Reform (STAR) managed care program in select urban areas of the state. In a managed care healthcare delivery model, a managed care organization (MCO) is paid a capitated rate per month for each member enrolled. Therefore, the MCO has an incentive to have quality healthcare delivered in the most efficient way in order to minimize their risk of financial loss (Bindman, Chattopadhyay, Osmond, Huen, & Bacchetti, 2005). By September 2005, all Texas counties were served by either STAR or Primary Care Case Management (PCCM), a healthcare delivery model similar to Medicaid managed care, except the medical home and health care services are provided by a network of primary care and/or other health care providers, instead of a MCO. By State Fiscal Year (SFY) 2014, approximately 80 percent of the state's Medicaid population was enrolled in some form of managed care (Texas Health and Human Services Commission, 2015a).

On March 1, 2012, the Demonstration expanded Medicaid Managed Care (MMC) statewide, replacing PCCM in predominantly rural areas, carving-in prescription drug benefits, non-behavioral health inpatient hospitalizations, and transforming the Children's Medicaid Dental program from fee-for-service to MMC.

EVALUATION GOALS

Four specific evaluation questions guided this portion of the evaluation (Evaluation Goals 1 through 4; STC 73.a.i):

Evaluation Goal 1: Evaluate the extent to which *access to care* improved through managed care expansion to new STAR and STAR+PLUS SDAs, dental services, and pharmacy services.

Demonstration focus goals include adult access to preventive/ambulatory health services, dental care for children, access to prescription drugs, and non-behavioral inpatient care.

Evaluation Goal 2: Evaluate the extent to which *coordination of care* improved through managed care expansion to new STAR and STAR+PLUS SDAs.

Demonstration focus goals include coordination of care among providers and service coordination.

Evaluation Goal 3: Evaluate the extent to which *quality of care* improved through managed care expansion to new STAR and STAR+PLUS SDAs, dental services, and pharmacy services.

Demonstration focus goals include quality of dental care for children and quality of adult preventive and emergent care.

Evaluation Goal 4: Evaluate the extent to which *efficiency improved and cost decreased* through managed care expansion to new STAR and STAR+PLUS SDAs, and dental services.

Demonstration focus goals include increased utilization rates, and an analysis of the experience rebate provision.

EVALUATION DESIGN

Over the five-year demonstration period, Texas anticipated initial changes to process outcomes first and then intermediate outcomes in later demonstration years. By monitoring process outcomes, Texas expected to reduce the likelihood of false negative results due to the limited time for detecting any health outcomes.

Although the overarching long-term impact is to maintain or improve health outcomes while containing cost growth, Texas focused on evaluating each process and associated health outcomes. The advantage of this strategy enables Texas and CMS to examine differences among specific health benefits (e.g., non-behavioral health hospitalizations) in order to identify which benefit(s) may be making the greatest positive impact and which health benefit(s) needs improvement.

A pre- and post- study design was used to evaluate the Demonstration's expansion of MMC programs and benefits into new SDAs from FFY 2009 through FFY 2015.

The overall analytic approach entailed two primary comparisons:

- Comparison of outcomes pre- and post-expansion by service delivery areas with each other. The pre-expansion period is FFY 2009 through FFY 2011 and the post-expansion period is FFY 2012 through FFY 2015.
- Comparison of outcomes in expanded service areas to non-expanded service areas

The evaluation is structured in this manner given the local variability among each expanded service areas in demographics, providers, hospitals and other healthcare resources, and other contextual factors.

KEY FINDINGS

Table 1. Evaluation Questions, Performance Measures, Analytic Approach, and Summary of Key Findings

	Evaluation Questions	Performance Measure/Indicator	Program Population	Analytic Approach	Evaluation Goal
Process Indicators	Did expansion of STAR to the Hidalgo SDA and STAR+PLUS to the El Paso, Hidalgo, and Lubbock, and MRSA SDAs impact access to care for the target population? (STC 73.a.i)	Children and Adolescent access to primary care (HEDIS® CAP-like) services	STAR eligible	Interrupted Time Series	Access to Care
		Adult access to preventive/ambulatory health services (HEDIS® AAP-like)	STAR+PLUS eligible	Interrupted Time Series	Access to Care
		Number of STAR+PLUS members who had inpatient hospital stays per 1,000 members	STAR+PLUS eligible	Interrupted Time Series	Access to Care
		Top ten diagnoses utilized during hospitalizations for STAR+PLUS members who had inpatient hospital stays	STAR+PLUS eligible	Descriptive Statistics	Access to Care
		Average number of miles from STAR+PLUS members to closest participating inpatient hospital in each new service area	STAR+PLUS eligible	Descriptive Statistics	Access to Care
	Has the carve-in of pharmacy benefits into capitated managed care impacted access to care for the target population? (STC 73.a.i.a)	Percent of members with major depression adherent to their medications (HEDIS® AMM-like)	STAR and STAR+PLUS eligible	Descriptive Statistics	Access to Care
		Percent of members with persistent asthma who have an asthma medication ratio of 0.50 or greater (HEDIS® AMR-like)	STAR and STAR+PLUS eligible	Descriptive Statistics	Access to Care
		Percent of members with schizophrenia adherent to their medications (HEDIS® SAA-like)	STAR and STAR+PLUS eligible	Descriptive Statistics	Access to Care
	Has the utilization of preventive (and care coordination) of dental services for children age 20 years and younger changed as a result of the expansion? (STC 73.a.i.b)	Percent of children's Medicaid dental services members who receive at least one diagnostic dental service in one calendar year	Children age 0 - 20 years	Descriptive Statistics	Access to Care
		Percent of children's Medicaid dental services members who receive at least two dental check-ups in one calendar year	Children age 0 - 20 years	Descriptive Statistics	Access to Care
		Percent of children's Medicaid dental services members who receive at least one fluoride treatment in one calendar year	Children age 0 - 20 years	Descriptive Statistics	Access to Care

Legend	
	Dark blue color indicates suggested marked improvements among selected measures associated with MMC expansion
	Blue color indicates suggested some improvements among selected measures associated with MMC expansion
	Light blue color indicates suggested declines among selected measures associated with MMC expansion

Evaluation Questions		Performance Measure/Indicator	Program Population	Analytic Approach	Evaluation Goal
Process Indicators	Did the expansion of STAR and STAR+PLUS to the new service delivery areas impact quality of care for the target population? (STC 73.a.i)	Percent of survey respondents who rated their health plans with a 9 or 10 (CAHPS®)	STAR and STAR+PLUS	Descriptive Statistics	Quality of Care
	Did the expansion of STAR and STAR+PLUS to the new service delivery areas impact care coordination for the target population? (STC 73.a.i)	Percent of survey respondents who felt their providers were well-informed (CAHPS®)	STAR and STAR+PLUS	Descriptive Statistics	Care Coordination
		Percent of Medicaid clients with existing patient claims	STAR+PLUS eligible	Interrupted Time Series	Care Coordination
Intermediate Health Outcomes	Did the carve-in of behavioral health services into STAR and STAR+PLUS impact care coordination as compared to behavioral health services being carved-out in the North STAR program? (STC 73.a.i.e)	Number of members with Serious Persistent Mental Illness receiving Mental Rehabilitative Services Ages 03 - 64	STAR and STAR+PLUS eligible	Difference In Difference	Care Coordination
		Number of members with Serious Persistent Mental Illness receiving Targeted Case Management Ages 03 - 64	STAR and STAR+PLUS eligible	Difference In Difference	Care Coordination
	Have dental MCOs reduced therapeutic dental care to the target population (children) over the demonstration period? (STC 73.a.i.b)	Number of members who received restorative dental services per 1,000 members	Children age 0 - 20 years	Descriptive Statistics	Quality of Care
	Have STAR and STAR+PLUS impacted preventable ER visits and hospitalizations over the demonstration period for the target population? (STC 73.a.i)	Number of preventable hospital admissions per 1,000 members	STAR STAR+PLUS eligible	Interrupted Time Series	Quality of Care
		Number of preventable emergency department visits per 1,000 members	STAR and STAR+PLUS eligible	Interrupted Time Series	Quality of Care
		Number of preventable hospital readmissions per 1,000 members	STAR and STAR+PLUS eligible	Descriptive Statistics	Quality of Care
	Has the carve-in of pharmacy benefits into STAR and STAR+PLUS impacted the number of hospital admissions due to an acute asthmatic or SPMI event? (STC 73.a.i.a)	Number of asthma hospital admissions per 100,000 members	STAR and STAR+PLUS eligible	Descriptive Statistics	Quality of Care
		Number of SPMI hospital admissions per 100,000 members	STAR and STAR+PLUS eligible	Descriptive Statistics	Quality of Care
Legend	Dark blue color indicates suggested marked improvements among selected measures associated with MMC expansion				
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Evaluation Questions		Performance Measure/Indicator	Program Population	Analytic Approach	Evaluation Goal
Intermediate Health Outcomes	Did the carve-in of behavioral health services into STAR and STAR+PLUS impact hospitalizations as compared to behavioral health services being carved out in the North STAR program? (STC 73.a.i.e)	Number or likelihood of hospitalizations of STAR and STAR+PLUS members, respectively, with Serious Persistent Mental Illness who received Targeted Case Management	STAR and STAR+PLUS eligible	Difference In Difference	Quality of Care
	Did the carve-in of nursing facilities into STAR+PLUS impact quality of care?	Rate of inpatient hospitalizations per 1,000 nursing facility clients	STAR+PLUS	Descriptive Statistics	Quality of Care
Cost Outcomes	How does Texas' Experience Rebate compare to Medical Loss Ratio regulation as a strategy for ensuring that managed care plans spend an appropriate amount of their premium revenue on medical expenses? (STC 73.a.i.c)	Amount of premium dollars returned to HHSC	STAR and STAR+PLUS eligible	Descriptive Statistics	Cost of Care
	Are there changes that could be made to the Experience Rebate provision or the Medical Loss Ratio regulation to improve upon the intended purpose of either mechanism? (STC 73.a.i.c)	Amount of premium dollars returned to HHSC	STAR and STAR+PLUS eligible	Descriptive Statistics	Cost of Care
Legend	Dark blue color indicates suggested marked improvements among selected measures associated with MMC expansion				
	Blue color indicates suggested some improvements among selected measures associated with MMC expansion				
	Light blue color indicates suggested declines among selected measures associated with MMC expansion				

CONCLUSIONS

On average, by Service Delivery Area (SDA), MMC increased access to care and utilization for STAR and STAR+PLUS programs. Although dental utilization continues to exceed national targets for access, there was an overall decrease in utilization for most dental measures since the expansion of dental managed care. However, preventive and diagnostic services remained the most frequently utilized services before and after expansion and children receiving at least one topical fluoride application did increase. The results indicate a focus on preventive care; and potentially more appropriate and efficient utilization of services as the service delivery model shifted from FFS to MMC.

Care coordination measures increased for STAR+PLUS clients for most SDAs as providers identified more ambulatory care clients as existing patients. Mental health rehabilitation services and targeted case management showed a small, but statistically significant increase throughout the state versus the comparison SDA. To evaluate one potential impact of carving in targeted case management services, the number of hospitalizations per and post-carve-in were analyzed; a decrease in hospitalizations was observed for members in STAR, STAR+PLUS, and NorthSTAR. However, Medicaid clients in STAR and STAR+PLUS who received targeted case management had a small statistically significant higher rate of hospitalizations and likelihood of hospitalization when compared to NorthSTAR members.

MMC demonstrated minor improvements in quality of care with decreasing trends for potentially preventable hospitalizations for STAR and STAR+PLUS programs and mixed results for hospitalizations due to asthma or severe persistent mental illness diagnoses. Potentially preventable hospital readmissions saw a slight decrease in the majority of expanded SDAs. Results for potentially preventable emergency room visits were also mixed for STAR versus STAR+PLUS programs. The evaluation of cost outcomes showed that more money was returned to Texas under the Experience Rebate provision compared to the money that would have been returned under the Medical Loss Ratio regulations.

MMC expansion supported Demonstration goals by building a foundation for an integrated healthcare delivery system that incentivizes quality and efficiency and continues to make improvements in healthcare quality and outcomes for the Texas Medicaid population. Although MMC expansion statewide has made progress, the benefits offered continue to change, suggesting that further evaluation for new MMC services and populations is warranted (see Appendix B for details).

CHANGES IN COLLABORATION AMONG ORGANIZATIONS

BACKGROUND FOR EVALUATION GOAL 9

One specific aim of the Demonstration is to increase the efficiency of service delivery and reduce costs through system transformation that emphasizes collaboration and integration of services. . Twenty regional healthcare partnerships (RHP) were created across the state as a structure for managing implementation of part of the Demonstration. RHPs could be characterized as mandated partnerships—the creation of which was required by external forces (Centers for Medicare and Medicaid Services (CMS) and the Texas Health and Human Services Commission (HHSC)) with clear financial incentives at stake for participating organizations. Organizational participation in an RHP was voluntary. However, organizations needed to join an RHP to receive Demonstration funding. Although RHP formation created some new relationships, the development of many RHPs built upon preexisting interorganizational relationships. The RHPs represent networks comprising relationships within sectors (i.e., hospitals, community mental health centers, public health departments), as well as relationships across sectors (i.e., relationships between hospitals and governmental entities, community mental health centers and public health departments, or other public-private partnerships). The composition of these RHPs varies, but at minimum includes the anchor institution (administratively responsible for coordination), participating intergovernmental transfer (IGT) entities (those providing local match dollars), and DSRIP performing providers.

Establishing and strengthening relationships among stakeholders within these regions is intended to improve capacity to collaborate and deliver health services more efficiently and effectively, particularly to the uninsured and those covered by Medicaid. Promoting collaboration

among organizations requires them to engage in relationships with a broader range of organizations that facilitate exchange of information and resources, as well as coordination of programs and services (Glisson & James, 1992).

Networks are understood to facilitate better coordination of service delivery functions and activities, thereby improving the quality, effectiveness, or efficiency of services to clients (Isett & Provan, 2005). In the current evaluation, networks are defined as the group of organizations participating in DSRIP through their RHP—as an anchor institution, IGT entity, or performing provider.

EVALUATION GOAL

Evaluation Goal 9: Evaluate the extent to which the establishment of RHPs increased collaboration among health care organizations and stakeholders in each region.

EVALUATION DESIGN

As DSRIP/UC funds are coordinated through RHPs, it is important to examine the networks as a whole rather than focusing on the perspective of individual organizations. The best quantitative measure for whole networks is an interorganizational network analysis where each organization reports on relationships or "ties" with each of the other organizations in the network (Provan et al., 2007). The evaluation team used this analytic method to assess the RHP-level networks using a pre/post, non-randomized design with no comparison group. In addition, qualitative questions were added as a follow-up to each quantitative question to gain additional contextual information about the content of the ties. Data collection focused on gathering information about interorganizational ties during three time periods:

1. Twelve months prior to the creation of the RHPs (referenced hereafter as T_0)
2. Calendar year 2013 (referenced hereafter as T_1)
3. Calendar year 2015 (referenced hereafter as T_2)

The sampling frame for Evaluation Goal 9 was all anchor institutions and organizations participating in DSRIP (IGT entities and performing providers) in all 20 RHPs. Organizations participating only in Uncompensated Care (UC) (N=92) were excluded from the study as these organizations have a more limited role in their RHP, restricted primarily to reporting and administrative interaction with their anchor. Data were collected at the organizational level (sampling frame: n=388 participating organizations for all 20 RHPs at T_0/T_1, and n=406 participating organizations for all 20 RHPs at T_2; the unit of analysis was at the RHP level (n=20)). Data were collected via computer-assisted telephone surveys with representatives of each participating organization. In some cases, the respondent elected to invite other organizational representatives to join the phone survey via conference call or speaker phone.

The network survey was structured such that each organization answered a series of questions about their relationship with each of the other organizations in their RHP (Provan & Milward, 1995; Provan & Milward, 2001). In addition, open-ended questions were added to probe for

qualitative information about the relationship, kinds of collaborative services, or nature of data sharing to assist in interpretation of the results. See Appendix C for further details.

Key network measures included in the analyses include (see complete list of key terms and definitions in Appendix C):

- **Density** – The number of existing ties among the network organizations as a proportion of the total possible ties.
- **Centralization** – A measure of the extent to which network ties are structured around one or a few organizations.
- **Multiplexity** – A measure of the strength of collaboration (or ties) between two organizations. Multiplexity is higher when organizations collaborate in more than one way.

KEY FINDINGS

On average across RHPs, network density, centralization, mean number of organizational ties, and multiplexity (strength of ties) increased from T_0 to T_1 and decreased from T_1 to T_2 (see Table 2). Consistently over time, interorganizational relationships based on delivery of programs and services demonstrated the highest network density, centralization, and mean number of ties across the State. The next highest set of network measures were for sharing tangible resources, followed by formal data sharing. Although the network measures were lowest for formal data sharing in all three time periods, these ties experienced the greatest percentage increase over the Demonstration period. Table 2 includes summary results across RHPs for all time periods.

Table 2. Summary of Network Characteristics, All RHPs Combined (n=20)

NETWORK DENSITY									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	36%	45%	36%	9	25%	-9	-20%	0	0%
Program and Service Delivery	33%	42%	33%	8	25%	-9	-21%	0	0%
Sharing Tangible Resources	13%	19%	14%	6	48%	-5	-28%	1	7%
Formal Data Sharing	10%	15%	14%	6	58%	-1	-5%	5	50%
NETWORK CENTRALIZATION									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	40%	49%	42%	10	24%	-7	-14%	3	7%
Program and Service Delivery	40%	44%	42%	4	11%	-2	-5%	2	5%
Sharing Tangible Resources	31%	40%	36%	9	29%	-3	-9%	5	17%
Formal Data Sharing	26%	37%	35%	10	40%	-1	-3%	9	36%
MEAN NUMBER OF TIES									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	5.5	6.7	5.8	1.2	22%	-0.9	-13%	0.3	6%
Program and Service Delivery	5.1	6.2	5.3	1.1	21%	-0.8	-14%	0.2	5%
Sharing Tangible Resources	1.9	2.6	2.3	0.7	39%	-0.3	-13%	0.4	21%
Formal Data Sharing	1.4	2.1	2.1	0.7	48%	-0.1	-3%	0.6	44%
STRENGTH OF TIES									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	1.6	1.7	1.8	0.1	6%	0.1	6%	0.2	13%

*Point change = Percentage point change in the measure across time periods (subtract the value of the measure from the furthest time period from the value of the measure from the most recent time period). Due to rounding, not all numbers add precisely.
**Percentage change = Change in the measure in the context of the starting point (divide the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$). Due to rounding, not all numbers add precisely.

Overall across the state, network density, centralization, and the mean number of ties for any organization increased from T_0 to T_1 and then decreased from T_1 to T_2, but varied considerably across the type of tie considered, as well as by RHP (see Appendix C for details). Thus, looking at the overall state data alone does not provide a complete understanding of the changes at the regional level, which experienced substantial variation.

NETWORK DENSITY

From T_1 to T_2, network density decreased across the state, resulting in an overall stabilization or slight increase from T_0. Several factors likely contributed to this phenomenon. In the time between T_1 and T_2, providers could withdraw without penalty from projects that were determined

non-viable during Demonstration Year 3. Thus, performing providers in some RHPs ultimately withdrew their DSRIP project(s). These providers remained in the sample for the evaluation to understand the impact of these changes. Additionally, after the initial inflow of Demonstration Year 1 resources that many organizations used to start their projects, some performing providers encountered challenges with the resource-intensive nature of their projects, the administrative burden of DSRIP, and the necessity to focus their time and attention on meeting their own metrics to be able to obtain payment. As stated by one organization:

> The number of emails and deliverables…outside the services and everything—there's not enough bandwidth to collaborate with more people and figure out processes. We are really tied up with the number of requirements to keep up with.

NETWORK CENTRALIZATION

From T_1 to T_2, centralization followed a similar pattern to density, decreasing on average statewide but resulting in an overall net increase across the full Demonstration period. As with density, this can be partially attributed to the withdrawal of DSRIP projects and resulting loss of some linkages between organizations. The net increase over time, however, may hinge on one or very few large IGT providers emerging in a region, typically large public hospitals/hospital districts. More centralized RHPs may indicate efficiency in disseminating information and resources throughout the network, but those networks may not be as equitable as those with a more decentralized structure and higher network density."

While network measures consistently tended to increase from T_0 to T_1 and decrease from T_1 to T_2 across RHPs, the largest increase in density, centrality, and total number of ties over the Demonstration period related to formal data sharing. This is important since data sharing may be a key component for patient care coordination across providers and geographies, and a more centralized network may indicate technical and practical efficiency in data sharing.

MULTIPLEXITY (STRENGTH OF TIES)

Although the overall increase in network density from T_0 to T_2 was slight, the strength of ties, or network multiplexity, between organizations increased consistently over the same time period. Between T_0 and T_1, the number of collaborative relationships among organizations increased overall across the state. The accompanying modest increase in tie strength suggests that organizations that already had collaborative relationships in place prior to the establishment of the RHPs generally did not change the nature of their relationships as part of Demonstration implementation. That is, in general there was a greater increase in new relationships compared to strengthening of existing relationships between T_0 and T_1. However, between T_1 and T_2, networks that saw overall decreases in density continued to see modest increases in ties strength. This may indicate that while networks lost ties overall from T_1 to T_2, ties were gained between organizations that were already collaborating in at least one way. This finding suggests that, at least for some organizations participating in the RHPs, partnerships have strengthened

over the Demonstration period. Stronger partnerships, as measured by the number of ways in which organizations are collaborating, indicate the potential for longevity in collaboration since the loss of one tie type (e.g., tangible resource sharing) does not lead to complete loss of the partnership. For the RHPs, this may mean that partnerships developed or maintained throughout the Demonstration period are sustainable.

INTERSECTORAL COLLABORATION

Beyond encouraging collaboration between organizations in the same sector, the formation of RHPs also led to more intersectoral ties over time, both within the defined RHP network and with external partners. Intersectoral ties were observed in all RHPs and for all tie types. In particular, the evaluation found a dramatic increase in ties to community mental health centers by other types of organizations, especially in the areas of tangible resource sharing and formal data sharing. The inclusion of community mental health centers, public health departments, and other non-traditional service delivery organizations, such as school districts as eligible DSRIP providers expanded the potential for intersectoral collaboration that may be necessary for comprehensive care delivery to the state's most vulnerable populations.

CONCLUSIONS

Taken together, network measures showed an increase from T_0 to T_1 and a slight decrease from T_1 to T_2. These patterns held for all measures except multiplexity. Despite the decrease from T_1 to T_2, there was an overall increase from T_0 to T_2 in all network measures, except in network density as related to all collaboration and program and service delivery. Several factors should be considered in understanding these results. First, the initiation of DSRIP incentivized early experimentation, as well as substantial enthusiasm about collaboration within regions. There was an early surge of collaborations linked to organizations getting their DSRIP projects fully operational. Over time, the pressure of meeting metrics and responding to required monitoring reduced the resources available for collaboration; organizations likely recalibrated their efforts to focus on meeting their metrics in order to receive payments. The Demonstration goal to promote and increase collaboration among service providers in order to transform the health service delivery system was observed in at least half of all RHPs for all tie types. Bringing in organizations that were not traditionally a part of the health service delivery system within regions fostered increased collaboration. However, the design of the Demonstration that only allowed for a single performing provider on a project to receive valuation-based payments may have disincentivized collaboration. This could be because other eligible performing providers could obtain more resources doing their own projects than collaborating and receiving only fair market value of the services they provided. Given the various changes and constraints encountered during implementation of the Demonstration, the projects that ultimately survived were those that organizations implemented primarily on their own.

STAKEHOLDERS' PERCEPTIONS & RECOMMENDATIONS

BACKGROUND FOR EVALUATION GOALS 10 & 11

Twenty RHPs comprising all Texas counties served as the structure for implementing the Demonstration. These partnerships were formed between March and June 2012. Early in 2012, there were few documented guidelines or processes for Demonstration implementation, so new information was being released by HHSC on a weekly, if not daily, basis. The early guidance for establishment of the RHPs was that they had to be contiguous counties and that the boundaries have some justifiable basis in historic patient flow. HHSC released a preliminary map suggesting what RHP boundaries might look like and asked the stakeholders across the state to modify and revise as needed.

Several basic governance structures are similar across RHPs, but beyond that, there is great variability. Across the state, each RHP has an anchor institution, and RHP membership includes organizations participating in Uncompensated Care (UC) and/or DSRIP. In some RHPs, those are the only recognized members; in others, organizations not participating (or not eligible to participate directly) in UC or DSRIP but that have an interest in the activities of the partnership are also included as members. The governance structures range in size and formality as well. At one end of the continuum are RHPs with written by laws and policies for governance, and at the other end are RHPs in which organizational members operate relatively independently except to meet mandatory requirements of HHSC or CMS. The anchor institution for each RHP serves as the administrative entity to coordinate members' compliance with required documentation and reporting.

Community partnerships are an increasingly common mechanism for pooling financial, human, social and political capital to improve health (Wendel, Burdine, & McLeroy, 2009). As community partnerships evolve, they frequently develop more complex organizational structures to facilitate planning, decision- making, and implementation of activities (Butterfoss, Goodman, & Wandersman, 1993; Butterfoss & Kegler, 2002; Goodman et al., 1998; McLeroy, Kegler, Steckler, Burdine, & Wisotzky, 1994). Examples of more complex organizational structures include formal policies and processes for the partnership, such as bylaws and subcommittee structures, as well as clear guidelines for how decisions are made and how conflict is addressed (Florin, Mitchell, Stevenson, & Klein, 2000). Role clarity also increases as partnerships develop, with specific responsibilities for leadership and partnership functions. Expected outcomes from more complex organizational structures include increased collaboration or capacity for collaboration to coordinate activities and deliver services more efficiently (Chaskin, 2001; Goodman et al., 1998; Kegler, Twiss, & Look, 2000; Wendel et al., 2009).

There is considerable variability in the way community partnerships are established, their composition, how they fulfill key functions, and how they are sustained over time (Butterfoss & Kegler, 2002). The complexity and broad range of approaches present substantial challenges

for evaluating partnership effectiveness (Granner & Sharpe, 2004). A systematic review by Granner and Sharpe (2004) synthesizes the literature, identifying factors of coalition functioning classified into four categories: (1) member characteristics and perceptions; (2) organizational or group processes; (3) organizational or group characteristics and climate; and (4) impacts and outcomes.

Aspects of each of these categories were critical to answering the research questions inherent in Evaluation Goals 10 and 11. The use of mixed methods allowed for specific constructs of partnership functioning and effectiveness to be measured quantitatively and others qualitatively, and the analysis of each type of data to contextualize the other.

EVALUATION GOALS

Evaluation Goal 10: Assess stakeholder-perceived strengths and weaknesses, and successes and challenges of the expanded managed care Demonstration, the UC pool, and the DSRIP pool to improve operations and outcomes.

Evaluation Goal 11: Assess stakeholder-recommended changes to the expanded managed care Demonstration, the UC pool, and the DSRIP pool to improve operations and outcomes.

EVALUATION DESIGN

The overall sampling frame included all organizations eligible to participate in the Demonstration UC and DSRIP projects and other defined stakeholders, which included advocacy groups, clinical providers, human and social service providers, and health plans. Stakeholder participation was solicited by emailing a link to the online survey (see Instrument section at the end of Appendix C) to organizational leaders at each RHP member organization and to other stakeholders who had requested inclusion on an HHSC Demonstration-focused distribution list. All responses were captured at the individual level, although the survey was analyzed by the type of organization the respondent represented. The recruitment strategy allowed for multiple responses per organization in recognition that, especially for larger organizations, different individuals in the organization might be knowledgeable about different aspects of the RHP and the Demonstration activities. Categories of measures included:

- Role Clarity
- Leadership
- Formalization
- Satisfaction with Group
- Communication
- Collaboration
- Conflict
- Decision-Making
- Strengths of Medicaid managed care, UC, and DSRIP
- Weaknesses of Medicaid managed care, UC, and DSRIP
- Recommendations for Medicaid managed care, UC, and DSRIP
- Reasons for Not Participating

- Greatest Opportunities of the Demonstration
- Greatest Challenges of the Demonstration
- Interest in Future Participation

The surveys were self-administered and web-based using the online survey service Qualtrics®. The survey was distributed to 6,679 individuals. A total of 533 respondents provided feedback in at least one module and these responses were included for analysis.

Finally, the learning collaborative activities across RHPs were reviewed and summarized as part of these evaluation efforts. To document the process outcomes of the RHP Learning Collaboratives, RHP learning collaborative plans and annual reports from Demonstration Year 3 and Demonstration Year 4 were reviewed and coded. Additional findings were extracted from the case study under Evaluation Goals 6-8.

KEY FINDINGS

Regional Healthcare Partnerships. Survey respondents were generally positive about anchor leadership and the productivity of communication between the RHP anchor and RHP members. Most stakeholders felt their voice was heard and that they were involved in RHP processes.

- **95%** of respondents were satisfied with their RHP's progress toward *addressing community needs*
- **94%** of respondents were satisfied with their RHP's level of *commitment to all partners having an opportunity to participate*
- **95%** of respondents were satisfied with their RHP leadership's level of *commitment to listen to the ideas and opinions* of stakeholders involved in the RHP
- **94%** of respondents agreed to some extent that their RHP *increased collaboration* among organizations in the region
- **98%** of respondents felt the Demonstration activities implemented by their RHP were at least somewhat *beneficial for the residents of their community*

Delivery System Reform Incentive Program. Stakeholders noted several key strengths of DSRIP. The most commonly reported strengths include:

- Having more resources to serve more patients/clients
- Creating the opportunity to design innovative projects
- Encouraging collaboration with other organizations in the area/community
- Improving access to health services programs
- Offering the opportunity for system reform

Stakeholders also expressed sentiments that DSRIP could have been improved in several ways. First, the majority of respondents suggested streamlining implementation processes (e.g. minimizing changes, setting clear expectations, and reducing administrative burden). In addition, stakeholders consistently expressed a need for clarity on outcome measures (e.g. aligning metrics, reducing changes, and accommodating differences in performing providers). Finally, many respondents felt that DSRIP design and implementation should be more sensitive

to context regarding expectations for outcomes and requirements for reporting, specifically the differences between urban and rural communities and large and small hospitals.

Uncompensated Care Program. Regarding the UC pool, stakeholders commonly indicated that the increase in funds available, the incentive to improve outcomes, and the increase in collaboration and participation in the program as key strengths. Some respondents felt that the UC pool was more complicated than the Upper Payment Limit (UPL) program that preceded. Other challenges repeatedly noted by stakeholders were the timeliness of UC payments, less money flow into hospitals, and the exclusion of certain providers from participation in the UC pool. The Demonstration did initially allocate more funds to the UC pool than had previously been disbursed through the UPL program; however, a key change in the program was the calculation of payments to hospitals under UC was cost-based rather than charge-based. In addition, for hospitals that received their IGT for participating in the UPL program from external sources (i.e., county or city funds), DSRIP provided those IGT entities another way to use their funds and to make their contributions contingent on performing providers achieving specific outcomes. For smaller private hospitals, this may have effectively decreased the IGT available to them for UC funds despite their being more funds allocated to UC across the state.

Medicaid Managed Care Expansion. Stakeholders participating in the survey indicated that from their perspective, the Medicaid Managed Care expansion aspect of the Demonstration had *improved* or made *no change* in the areas of:

- Pharmacy benefits manager
- Provider networks
- Access to prescription drugs
- Patient adherence to prescription drugs
- Value-added benefits for clients
- Patient access to services provided
- Quality of services provided
- Cost of services provided and
- Coordination of care among service providers

Respondents also indicated a decline in key areas of improvement were timeliness of claim payments, the level of administrative burden, and claims processing. Respondents' qualitative recommendations regarding Medicaid Managed Care focused on improving MCO operations; streamlining and standardizing processes; reducing administrative burden on providers; and strengthening communication within the system.

Overall Experience. Of those respondents not participating in the Demonstration, almost 15% indicated that they did not participate because their DSRIP project was not approved. Another 15% did not want to participate, even when they were eligible, and 10% could not find IGT to support UC or DSRIP projects. Others were uncertain about their eligibility, had problems with coordination during the Demonstration planning phase, or were discouraged by the limited flexibility of the Demonstration. Even so, almost half of all survey respondents said they would participate in the Demonstration in the future if given the opportunity.

Key demonstration opportunities as identified by non-participating organizations:

1. Improving the quality and overall value of services provided
2. Addressing contextual differences within communities and regions that are important for operations and outcomes
3. Focusing on mental and behavioral health

Key demonstration challenges as identified by non-participating organizations:

1. Exclusion of certain types of providers and services
2. Limited menu of DSRIP project options
3. Competing agendas of the many organizations involved
4. Time and effort needed to define and understand new systems for implementation, documenting and reporting UC and DSRIP activities

Key recommendations from stakeholders responding to the survey:

1. Develop rules, reporting mechanisms, and payment schedules ahead of time
2. Limit Demonstration changes
3. Decrease administrative burden on participating organizations
4. Address differing implementation challenges faced by urban and rural (or large and small) hospitals
5. Maintain a focus on long-term sustainability

Organizations within RHPs were able to participate in learning collaborative activities aimed at quality improvement. All 20 RHPs are either leading their own or actively participating in other learning collaboratives. Participation in the learning collaboratives is reported as high, although competing priorities for providers and geographic distances are barriers to participation. RHPs report offering more webinar meeting options to encourage participation. The learning collaboratives focus on a variety of topics, including behavioral health care, access to primary care, chronic disease prevention, and patient engagement. Since Demonstration Year 3, RHPs have defined more measures to evaluate through their learning collaborative.

CONCLUSIONS

The RHP as a mechanism for implementation of the demonstration was successful.
Overall, RHP members were satisfied with their RHP and how it operates to facilitate their participation in the Demonstration. Members overall expressed satisfaction with their anchor institution's leadership and guidance, as well as the anchor institution's effectiveness in providing information and managing meetings. However, there is variation among RHPs with a few less satisfied members.

The RHP learning collaboratives are complementary to other demonstration activities.
RHP reports indicate that the learning collaboratives are experiencing high levels of participation, but the anchors report challenges in maintaining this when providers face a number of priorities in terms of project implementation and reporting, time constraints, and lack of financial incentives for participation and data sharing. Overall, RHP anchors report that the

learning collaboratives have been most beneficial for encouraging new collaborations, sharing best practices and lessons learned, and facilitating shared problem solving.

The Demonstration program offered opportunities and challenges for local providers and communities.

The survey indicates that Demonstration stakeholders are generally satisfied with how the Waiver has been implemented and with their experiences during implementation, despite start-up issues. Key stakeholder concerns and recommendations for going forward primarily focus on streamlining processes (DSRIP and MMC), timelines, and payment schedules (UC and DSRIP); eliminating frequent changes (DSRIP); recognizing and addressing the unique implementation challenges of different types of providers (DSRIP); and including more provider types that were previously excluded (DSRIP and MMC).

The primary themes emerging from stakeholder responses regarding key strengths of the Demonstration include increases in available funding (UC and DSRIP), the opportunity for innovation (DSRIP), the emphasis on public-private partnerships (DSRIP), and systems for accountability (UC and DSRIP). Key weaknesses identified by stakeholders included timing of implementation (DSRIP); the changing rules and expectations (DSRIP and MMC), the exclusion of certain types of providers (DSRIP and MMC), lack of infrastructure at multiple levels (UC, DSRIP, and MMC); the broad scope of Demonstration activities, the limited project "menu," and the politics involved at the local and state levels (DSRIP).

In response to identified challenges, HHSC maintained proactive and transparent communication with the Anchors and performing providers, providing up-to-date information and soliciting feedback through: biweekly Anchor calls, technical assistance, webinars, reporting templates and companion documents, Executive Waiver Committee meetings, and annual Statewide Learning Collaborative Summits.

EFFECTS ON HEALTH CARE QUALITY, POPULATION HEALTH, AND COSTS

BACKGROUND FOR EVALUATION GOALS 6 – 8

The Texas Demonstration seeks to shift health care toward prevention, thereby improving health care quality, population health, and health care delivery cost effectiveness. A particular issue DSRIP has the opportunity to address is how often patients use emergency departments (ED) when their immediate conditions do not warrant emergent care or could have been avoided through preventive care. The annual cost of potentially preventable visits to EDs in Texas has been estimated to exceed $1 billion (Texas Health and Human Services Commission, 2012, p. 5). According to the same report, "one of [Texas'] key strategies to

reducing non-emergent ED use is to steer clients to more appropriate sources of care" (p. 5). Within the context of the Demonstration, many DSRIP projects were designed to reduce ED visits and curb costs of care while maintaining or improving quality of care and health of populations served. Among the Demonstration strategies were care navigator-facilitated disease prevention and management. A particular focus was ED visits for ambulatory-care sensitive conditions, because these were believed to be preventable given effective use of primary and other routine health care as well as health education.

EVALUATION GOALS

Evaluation Goal 6: Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted the **quality** of care.

Evaluation Goal 7: Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted **health** of the population served.

Evaluation Goal 8: Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted the **costs** of providing that care.

In addition, the evaluation team examined which processes and contextual factors affected quality of care, population health, and costs of providing that care.

EVALUATION DESIGN

The evaluation team used a comparative case study to trace the evolution and impact of one major type of DSRIP project—care navigation. When the project type for the current evaluation was chosen, patient navigation, typically relating to emergency department use, was among the top three most common DSRIP project types. Other common types of DSRIP projects were considered and eliminated as either not revealing enough about the Demonstration's goals to improve system integration (e.g., primary care provider supply) or not present statewide. Care navigation projects, in addition to occurring statewide, were selected for their focus on community-based prevention and their reflection of the complexities affecting intended system transformation. A statewide sample of 10 DSRIP care navigation projects was chosen, including urban and rural sites. Ten comparison providers without this particular type of DSRIP project were included to improve attribution of project effects to the Demonstration, versus other co-occurring changes. Hence, the sample was intended to represent the impact of some key facets of DSRIP statewide. However, the generality of findings from 10 care navigation projects to a total of over 1,500 other DSRIP projects is unknown. By picking projects before they started, the evaluation avoided the risk of erroneously attributing success to factors that were simply present more often in the successful than the less successful projects. By examining projects through their first 2 years of operations, the evaluators traced implementation and outcomes over time.

Data collection included repeated site visits; interviews with provider organizational and project leadership as well as front- line staff; surveys of community partners, at project inception and two years later; interviews and focus groups with patients and family members; a statewide phone survey of patients; and hospital discharge data for two case and two comparison sites

was obtained. Multiple regression models using patient survey data were used to address the three Evaluation Goals, relating to the impact of this type of DSRIP project, on quality, health, and cost outcomes. Qualitative analyses of staff and patient experiences, the effects of rurality on projects, and sustainability were used to interpret the correlational results.

KEY FINDINGS

DSRIP PROJECTS OVERALL

The majority of DSRIP providers surpassed their quantifiable patient impact (QPI) goals by exceeding the number of individuals they planned to serve or encounters they intended to provide. In DY3 and DY4, 92 to 98 percent of projects met or exceeded expectations, with over 70 percent in DY5. Category 3 funds were earned as DSRIP projects met their corresponding metrics and milestones. When analyzed by project type, average Category 3 earnings were almost 100 percent for all project types in DY 2 and DY3; in DY4 all project types earned over 90 percent of their Category 3 funds, on average; and in DY5, different project types had earned an average of 76 to 96 percent of their Category 3 payments. QPI and Category 3 payments for DY5 were not yet final at the time of this report.

EFFECTS OF CONTEXT ON DSRIP PROJECTS AND OUTCOMES

Alignment with Wagner's Chronic Care Model. One of the 10 care navigation projects was loosely based on Wagner's Chronic Care model, which emphasizes facets of local and organizational contexts potentially applicable to all systems serving patients with complex needs. Some of these factors were associated with better patient outcomes. In CN projects where staff had more role clarity, patients in turn had a higher probability of reporting having information about treatment options and reported better mental health. Transportation was also positively associated with patients' information about treatment options, perhaps because of better access to clinicians.

Rurality. Rural sites faced distinctive disadvantages in launching and sustaining projects. Although all projects were challenged to meet the needs of patients with complex needs—often more complex than project leaders had anticipated—rural providers appeared to face distinctive disadvantages. Of the four small rural sites in the study, one hospital was unable to launch its DSRIP care navigation project. This was the evaluators' first indication that rural providers might have more difficulty succeeding within DSRIP's incentive payment structure, given its complexities, high administrative burden, changing rules, and uncertain financial compensation, as well as additional market challenges, such as those related to health insurance networks. For evaluation purposes, the hospital that was unable to launch its DSRIP CN project was replaced with a similar hospital in the same region. Approximately a year after most projects in the evaluation sample had started, a second rural hospital closed. Finally, by the last site visit, another rural DSRIP care navigation project was not providing CN services to any new patients, although it was still officially operating, and hence was retained in the sample. Rural site leaders

attributed their DSRIP challenges in part to difficulties recruiting and retaining providers, an account corroborated by the disproportionate tendency for rural patients surveyed by phone to report lower access to health care. Professionals at rural sites also noted their small scales of operation as well as limited local health and human services, although they also cited advantages such as often having known patients for a long time.

Incentive payment model. Part of DSRIP's innovation is its incentive payment structure, but this also created challenges within project sites. CN project leaders often expressed goals in terms of metrics reportable to the state, which naturally emphasized the number of Medicaid and low income uninsured people served. Sometimes, care navigators perceived these quantitative goals as competing with having enough time to meet patients' complex health, social, and economic needs. Several projects expanded eligibility criteria to serve people with additional or more serious health conditions and increased the intensity of services to address the needs of people with the most complex conditions.

Sustainability. Sustaining projects will be difficult absent continued DSRIP funding. Professional interviews across all project sites revealed concerns about the financial sustainability of DSRIP-funded projects. Key informants at most sites indicated total dependence on DSRIP, with no plans to sustain their projects without continued DSRIP funding. Most sustainability planning went no further than expressed hopes that resources would continue to be available through the Demonstration renewal, or funding by the projects' lead agencies, such as might be justified based on savings achieved through reduced ED use. The evaluation team also inferred disconnects at four project sites between what organizational leadership said about sustainability and front- line staffs' beliefs or hopes that the projects would continue without DSRIP funding. Only one site specified definite plans to continue their CN project, albeit at a reduced scale. Rural projects, with limited presence of traditional health and human services partners, appeared particularly reliant on private resources such as faith-based organizations and community members. While this support was appreciated, it was not necessarily viewed as sufficient to sustain CN in the absence of continued DSRIP funding.

EFFECTS OF RELATED PROCESSES ON HEALTH CARE QUALITY, POPULATION HEALTH, & COSTS

Although DSRIP CN as a whole did not yet improve outcomes on average compared with usual practice, some components of CN processes and organizational context were associated with better patient outcomes, primarily in quality, all of which are shown in Appendix E. Three of the 10 DSRIP CN projects were based on the Coleman's Care Transitions model (Coleman 2006).

Patients who reported some of the disease self-management practices outlined within the Coleman model, such as using a personal health record to manage their health care, were more

likely to have enough information about treatment options.[1] Patients who had enough information about how to manage their health conditions were more likely to report agreement among providers.[2]

One of the challenges of evaluating programs for patients who have complex needs can be disentangling services they may experience as a blur. Of the patients identified by DSRIP CN project staff as receiving CN, only about half were aware that they had received this service.

However, among patients at both DSRIP CN and comparison sites who reported having received CN, perceptions of better coordination with their care navigators were positively associated with perceived level of information about treatment options[3] and slightly better access to health care.[4] Likewise, CN planning with patients was associated with patient perceptions of having information about treatment options[5].

Despite a variety of efforts throughout Texas to reduce preventable ED use, 90% of both DSRIP CN and comparable patients at comparison sites surveyed for this evaluation said they would return to the ED if they experienced the same condition that precipitated their last visit. Neither were any other related services were associated with differences in this outcome. Common reasons why patients said they would return to the ED included anticipating re-occurring emergent health needs, EDs offering faster treatment than alternative options, and general satisfaction with care provided by EDs.

The nature of ED-related CN as well as organizational capacity to launch and sustain these projects differed substantially across sites. Although the evaluation team began sampling projects with a single DSRIP project option (2.9.1 – navigation services to targeted patients at high risk of disconnect from institutionalized health care), in order to include all major regions of Texas, the evaluators added some projects with different primary foci, such as readmissions. However, each DSRIP project selected for the case study used CN and cited reducing ED use as a logical outcome in their project plans.

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[1] Appendix E, Table 21. Multiple Regression Models of the Association between Coleman's Transitions Care Processes and Quality of Care
[2] Appendix E, Table 26. Multiple Regression Models of the Association between Patient Access to Information and Quality of Care
[3] Appendix E, Table 23. Multiple Regression Models of the Association between Patient Perception of Coordination with their Care Navigator and Quality of Care
[4] Appendix E, Table 27. Multiple Regression Models of the Association between Patient Perception of Quality of Coordination with their Care Navigator and Quality of Care
[5] Appendix E, Table 24. Multiple Regression Models of the Association between Patient-Developed Care Plan and Quality of Care

Several DSRIP CN projects examined in this evaluation were based directly in hospitals, three were operated through emergency medical services, and two were led by community mental health centers. Care navigators in six sites made home visits, and one project led by a community mental health center focused on people identified through mental health crises. However, all DSRIP care navigation included contacting patients with or at risk of emergency department (ED) use, talking with patients about their individual needs, educating them about healthy behaviors such as nutrition and smoking cessation; disease self-management, including medication use; and referring patients to needed health and social services. The amount of follow-up after initial contact varied across projects according to their differing designs, as well as often very substantially within projects according to patient needs.

Care navigators cited among their key partners physical and mental health care providers, home health services, faith-based organizations, and other agencies providing poverty relief, such as those related to transportation, food, and housing. Both the number of care navigation key partners and interdependence with these partners increased over the first 2 years of DSRIP CN project implementation. These patterns suggest progress toward the Demonstration's goal of building local systems of care, in addition to the regional systems developed through RHPs.

OUTCOMES OF DSRIP CARE NAVIGATION RECEIPT ON HEALTH CARE QUALITY, POPULATION HEALTH, & COST

As specified by Special Terms and Conditions (STC) 73.a.iii, the first question to be answered by this part of the evaluation was whether DSRIP improved health care quality, population health, and cost outcomes. Regression analyses did not show that patients receiving DSRIP care navigation (CN) had better health care quality, health, or cost-related outcomes than patients at other sites overall; but analysis of hospital discharge data for some sites did find a decrease in hospital encounters after receipt of CN. This was true after controlling for potential confounders such as patient comorbidities, demographics, and health insurance status. One reason for the lack of quantified impact of CN may have been how often patients at comparison sites without DSRIP-specific CN were receiving other CN or related services. This likely reflects the fact that most comparison sites had other DSRIP projects, as well as the current general emphases on CN and reducing preventable emergency department use and readmissions. Subsequent supplementary analyses of hospital data will examine pre-post CN changes in hospital use at a subset of the providers in the study. Another potential reason for the lack of overall quantitative results is that CN was often limited to a single patient assessment and referral for any relevant services, although many patients received more extensive CN, including health education, help accessing services, and follow-up. Qualitatively, DSRIP CN patients, family members, and care navigators reported benefits including emotional, advocacy, informational, and tangible support, as well as less frequently noted improvements in health behavior, health, and reduced use of emergent health care.

CONCLUSIONS

The current evaluation was unable to link quantitatively the DSRIP project type evaluated to improved health care quality, health, or cost outcomes in the areas measured, on average. However, analyses did find a decrease in hospital encounters after receipt of care navigation, and did identify some specific processes and aspects of organizational context that appeared to support desired outcomes.

This portion of the evaluation focused on 10 care navigation DSRIP projects from a total of approximately 1,500 DSRIP projects. Major project focuses in addition to care navigation include behavioral healthcare; access to primary care; chronic care management; access to specialty care; and health promotion/disease prevention. As Texas considers pathways toward potential integration of elements of DSRIP into Medicaid managed care, as well as more generally transitions toward quality-based payment, results from the current and other evaluations might inform decisions about not only the types of projects to fund but also which related processes and capacities to emphasize.

Statewide, DSRIP also created both opportunities for innovation and pressure on health care organizations and their staff. Rural providers in particular appeared to struggle with implementing and sustaining the DSRIP projects examined in this evaluation. HHSC has sought to support all providers through a variety of mechanisms. Nonetheless, rural providers may need more tangible support to succeed in an incentive payment model future.

Finally, in the fifth year of the current Demonstration, none of the DSRIP project providers had plans to continue at scale without continued DSRIP funding. HHSC is requiring DSRIP project sustainability planning. However, sustainability will hinge largely on predictable revenue, which the majority of patients served do not have the means to provide and hence would need to come from local governments, as well as other sources such as private philanthropy. Results from this evaluation may be used in a renewal for building on project successes to date while continuing to experiment with how best to balance flexibility, accountability, and simplicity.

EFFECTS ON UNCOMPENSATED CARE COSTS

BACKGROUND FOR EVALUATION GOAL 5

POTENTIAL IMPACT OF THE DEMONSTRATION ON UC

Uncompensated care (UC) cost is defined as the cost of providing services to individuals who are uninsured or covered by Medicaid, less any payments received from uninsured or Medicaid patients for such services (labeled the "uninsured shortfall" and the "Medicaid shortfall"

respectively). A provider may claim uncompensated costs for inpatient and outpatient services, as well as related costs for physician, clinic, and pharmacy services.

The most immediate impact of the Demonstration on UC cost was the change in the mechanism used to determine provider payments for UC. Prior to the Demonstration, payments to facilities were determined under the Upper Payment Limits (UPL) system, which limited supplemental payments to an estimate of the amount that would be paid for services for Medicaid patients under Medicare payment principles.

The Demonstration replaced the older UPL program with a new funding pool to partially reimburse providers for UC costs, and created a new, additional pool to promote health system transformation (Tavenner, 2012). Specifically:

1. A UC payment pool was created to provide reimbursement for UC costs incurred by providers based on the level of eligible UC cost as reported in the annual Disproportionate Share Hospital/Uncompensated Care (DSH/UC) application (Texas Health and Human Service Commission [HHSC], 2016a). As under the prior UPL program, the UC payment pool provides a supplemental payment to providers, but based on UC costs, rather than claims for UC charges(converted to approximate Medicare payment levels) as in the UPL program.

2. A Delivery System Reform Incentive Payment (DSRIP) pool was created with managed care savings to incentivize hospitals and other providers to transform their service delivery practices to improve quality, health status, patient experience, coordination, and cost-effectiveness. Unlike the UC payment pool, the DSRIP payment pool is not a cost-based payment system linked to UC costs, but improvements attributable to DSRIP initiatives may indirectly affect UC costs over time.

Other aspects of the Demonstration could also affect the amount of UC costs and, correspondingly, the amount of payments to providers. The non-federal share of the UC and the DSRIP payment pools are typically funded through intergovernmental transfers (IGTs). These IGTs are local public matching funds that are required to receive the federal share for both UC and DSRIP payments. Thus, the limited local IGT funds must be split between the two pools of funds. Under the Demonstration, claims for payment from the UC pool are independent of participation in DSRIP projects, although UC pool recipients are required to participate in a Regional Healthcare Partnership (RHP) and, beginning with Demonstration Year 3, to complete DSRIP population-focused reporting requirements ([Category 4] Potentially Preventable Events). The DSRIP pool provides an incentive for participating organizations to enhance the efficiency and effectiveness of service delivery by providing payments for DSRIP projects that meet identified performance metrics.

The Demonstration also expanded Medicaid managed care (MMC) to new service delivery areas and carved-in non-behavioral health inpatient services into managed care, which were previously covered through a traditional fee-for-service (FFS) payment system. If MMC delivers services more efficiently than FFS, UC in the form of Medicaid shortfalls should decrease as the share of Medicaid enrollees in MMC increases. Also, the Affordable Care Act (ACA) insurance mandate may increase Medicaid enrollment among those previously eligible but not enrolled.

However, the impact of these Medicaid enrollment changes on hospitals' Medicaid shortfall may be muted by existing provisions for retroactive enrollment of Medicaid-eligible patients who are hospitalized.

EVALUATION GOAL

Evaluation Goal 5: Evaluate whether the two new funding pools, UC and DSRIP payment pools, were effective in assisting Texas hospitals with their UC costs, and assess whether any changes in UC costs were attributable to the DSRIP Demonstration interventions.

EVALUATION DESIGN

DATA

Table 3. Timing of Availability of Uncompensated Care Cost and Payment Data

UC/UPL Data to HHSC	Payment Period between		Payment Data for Program	Reflecting Costs Incurred between		Cost Data for Program	Notes	Data Availability
UPL 2011	10/1/2010	9/30/2011		10/1/2008	9/30/2009			
UC 2012	10/1/2011	9/30/2012	DY 1	10/1/2009	9/30/2010			Data available for final report
UC 2013	10/1/2012	9/30/2013	DY 2	10/1/2010	9/30/2011			
UC 2014	10/1/2013	9/30/2014	DY 3	10/1/2011	9/30/2012	DY 1		
UC 2015	10/1/2014	9/30/2015	DY 4	10/1/2012	9/30/2013	DY 2		
UC 2016	10/1/2015	9/30/2016	DY 5	10/1/2013	9/30/2014	DY 3	DSRIP projects operational	Data unavailable during Demonstration
UC 2017	10/1/2016	9/30/2017		10/1/2014	9/30/2015	DY 4		
UC 2018	10/1/2017	9/30/2018		10/1/2015	9/30/2016	DY 5		

DSRIP indicates Delivery System Reform Incentive Payment; DY, Demonstration Year; HHSC, Texas Health and Human Service Commission; UC, Uncompensated Care; UPL, Upper Payment Limit.

There is no standard definition of UC costs across federal programs. Thus, no standard federal estimate of total hospital UC costs is available (Government Accountability Office [GAO], 2016). In Texas, the UC cost is most accurately measured through the annual DSH/UC application. The alternative measure is Hospital Form 2552-10, but it has limitations, such as vague definitions of key measures and discretion about specific accounting methods used to report some costs. The DSH/UC application uses 2-year lagged cost data adjusted for inflation as an estimate of the UC cost for the year of payment. Table 3 details the data available for the final report. Data for DY3 to DY5 is not available due to the lag in reporting. Given the timing of DSRIP program implementation under the Demonstration, more follow-up time is needed for any valid inferences regarding the quantitative impact of the Demonstration on UC cost.

DESCRIPTIVE TREND ANALYSIS

Using all hospital data from the DSH/UC application from Fiscal Year (FY) 2012 to FY2015, we conducted a descriptive trend analysis for UC cost, supplemental payments to assist hospitals

for this cost, and the percentage of hospital shortfall covered by the UC payments from the UC pool. First, UC cost was broken out into Medicaid shortfall, uninsured shortfall, and UC costs related to hospital-affiliated physician, mid-level hospital, and pharmacy services. This trend analysis covered actual UC cost data from FY2010 to FY2013. Then, the two main supplemental payment mechanisms, DSH payments and UC pool payments, were tracked over time to address the question specified in the special terms and conditions (STC): "What percentage of providers' UC cost was made up by payments from the UC pool?" We subtracted out DSH payments from the total UC costs, and calculated the percentage in the remaining hospital unreimbursed cost.

We did not include DSRIP payment in this shortfall calculation because "DSRIP payments are not direct reimbursement for expenditures or payment for services" (STC 46(e)). As an incentive program, DSRIP payments are not applicable when considering hospitals' supplemental payments. The investments and operating costs associated with implementing and maintaining DSRIP initiatives were not reported to the state and some of these expenditures may not be eligible to be claimed for Medicaid.

We conducted sub-analyses by hospital type, similar RHP groupings, rural/urban continuum using the Rural-Urban Continuum Code (RUCC) and Rider 38 hospital status. In the sub-analysis, we normalized the cost and payment data to per bed to account for variation in hospital size. The payment data covered FY2012 to FY2015 while the cost data covered FY2010 to FY2013. All dollar amounts were converted to 2012 constant dollars to adjust for inflation using annual average data for the Consumer Price Index (Bureau of Statistics, United States Department of Labor, n.d.) unless otherwise specified (See Appendix F for details).

DATA LIMITATIONS FOR INFERENTIAL ANALYSIS

There were significant challenges in achieving the evaluation goal given time lags in the availability of the requisite UC cost data, coupled with delays in the implementation of DSRIP projects. See Appendix F for a timeline of events and data availability. As a result, the quantity of post-DSRIP UC cost data available for analysis for this final evaluation report were inadequate to allow any valid inferences regarding the quantitative impact of the Demonstration on UC cost.

We designed a study that could be used to analyze the effect of DSRIP payments on UC cost, given additional years of post-intervention data. This multivariate regression model would estimate the association between hospital UC costs and DSRIP payments, both to the hospital (if any) and cumulatively to other hospitals in the same RHP (both lagged 1 year), accounting for hospital characteristics (such as provider type and size) and regional characteristics (such as rurality and RHP fixed effects). Unfortunately, as noted, this study design cannot be applied until additional years of more recent UC cost data are available. For example, the first year of DSRIP payment data represented FY2013, which in the model would affect UC cost in FY 2014, but UC cost data for FY2014 will not be available until early 2017. Even more importantly, given that Demonstration Year 2 DSRIP payments were infrastructure payments, DSRIP funded programs began to be fully operational in Demonstration Year 3, which implies the impact of DSRIP

programs on UC may not be observable before UC cost data from FY2015 become available in 2018 (see Table 3). The details of the inferential analysis method can be found in Appendix F.

KEY FINDINGS

There were a total of 353 hospitals that reported at least one year of UC cost between FY2010 and FY2013, with variation in participation over the years with the smallest number of reporting hospitals in 2012, which was a transition year. The analysis with only hospitals that were participating in all 4 years (N=263) had similar results except for less increase from 2012 to 2013 (See Appendix F).

Figure 1 depicts the total UC costs in Texas categorized by source of payment between 2012 and 2015. Also reported is the number of hospitals participating in each year. There was a noticeable increase in UC payments (21%) from 2010 to 2011 due to an increase in the number of hospitals reporting UC costs. This was followed by a slight temporary drop (5%) in 2012. Considering 2010 data to reflect a transitional year, from 2011 to 2013,

- overall hospital UC increased slightly by $148 million (reflecting a 2% increase),
- with a $96 million (4%) decrease in Medicaid shortfall,
- $498 million (13%) increase in the uninsured shortfall, and
- $255 million (23%) decrease in physician, mid-level hospital, and pharmacy services.

Figure 2 categorizes the UC cost by supplemental payments and shortfall (light blue on top). There was an initial 27% increase in shortfall in the first year mostly due to the increased UC cost. The shortfall continued to increase between Demonstration Year 2 and Demonstration Year 4 (53% increase), largely due to decrease in both DSH ($10 million, 1%) and UC ($827 million, 22%) payments.

Figure 3 depicts the trend of the percentage of hospital unreimbursed cost (i.e., UC costs after DSH payments) made up by UC pool payments by hospital type. At the start of the Demonstration in 2012, over all hospitals, 67% of the UC costs were covered by the UC pool payments. This rate dropped steadily over time to only 50% in Demonstration Year 4 with an average annual drop of 4%. This represented a $2.8 billion shortfall in 2015 after supplemental payments. Most of the drop occurred in public hospitals, which dropped from 84% to 52% in 4 years. See Appendix F for more detailed analyses.

A total of 1,488 DSRIP projects were provided by 295 providers such as hospitals, physician practices, health departments, and community mental health centers (HHSC, 2016). They received a total of $6.2 billion DSRIP payments between Demonstration Year 2 to Demonstration Year 4. Figure 4 depicts the actual payments in each year. Two hundred and fifteen hospitals were participating in both the DSRIP and the UC pool with some providers participating only in the UC pool or DSRIP pool. Major project areas were behavioral healthcare (22%), primary care (21%), specialty care (14%), general access to care (5%), care navigation (20%), chronic disease management (4%) and health promotion and disease prevention (7%). Other program areas, such as "redesign of cost containment" made up the last 7% of the total dollars spent in DSRIP. The impact of these programs and payments on UC costs in Texas cannot be determined at this time. See Appendix F for more details.
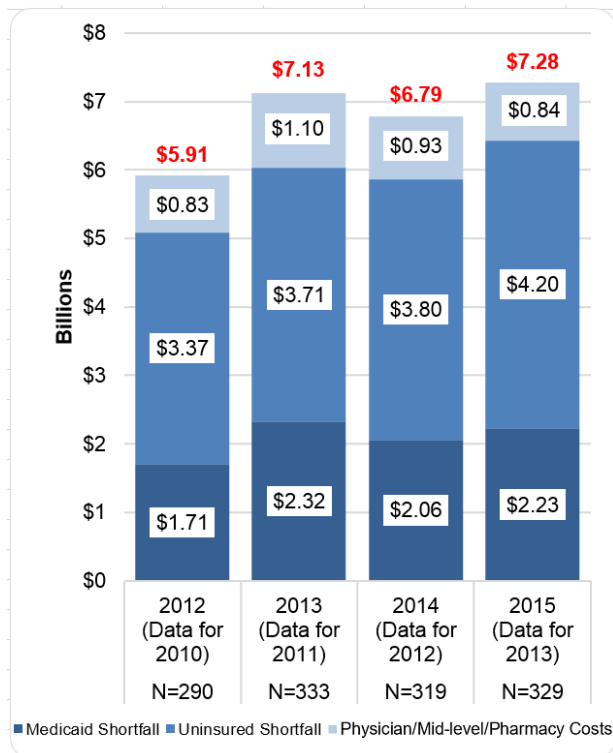
Figure 1. UC Costs in Constant 2012 Dollars for All Hospitals (Overall N=353)
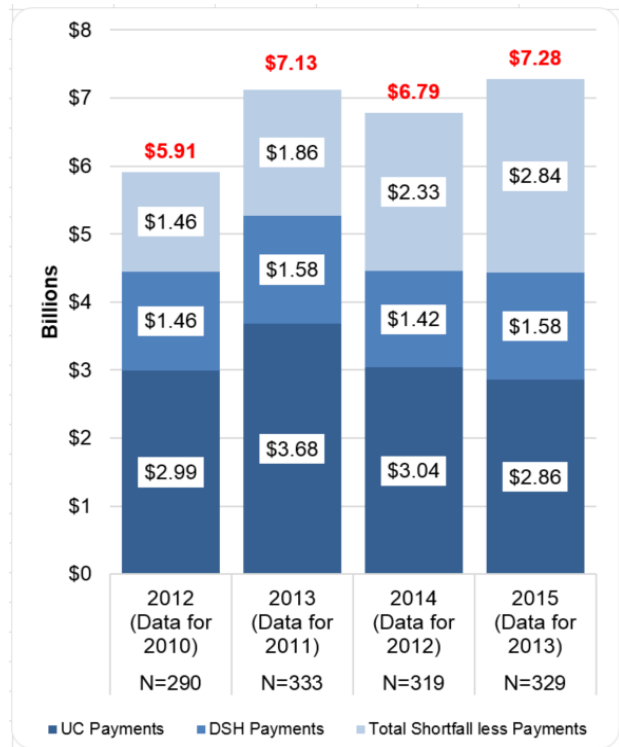

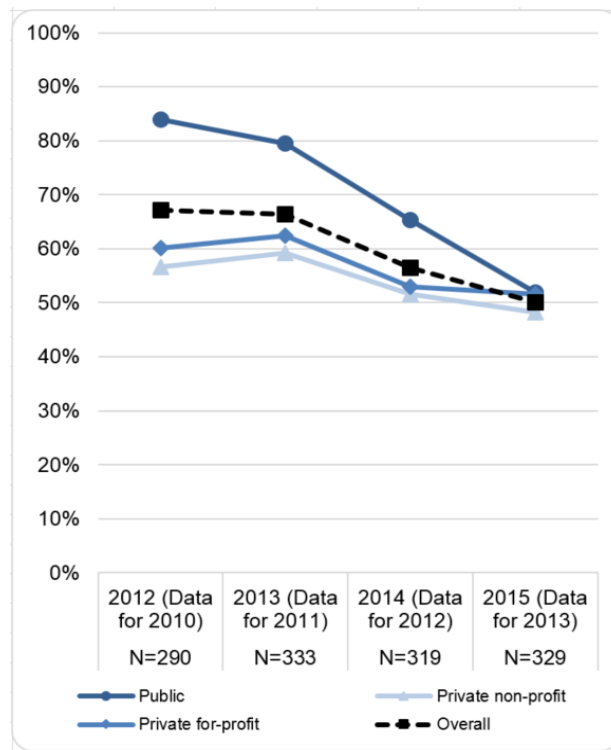Figure 2. Payments & Shortfalls in Constant 2012 Dollars for All Hospitals (Overall N=353)

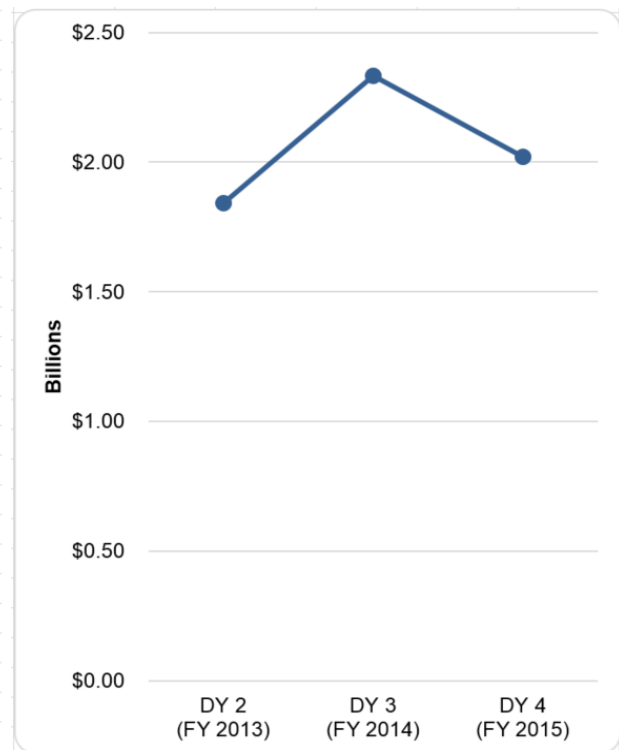Figure 3.Percentage of Unreimbursed Costs Covered by UC Pool Over Time by Hospital Type

Figure 4.DSRIP Annual Payments (DY2 to DY4)

Data on stakeholder perceptions of the changes in and impact of UC payment were collected as part of the telephone survey deployed under Evaluation Goal 9 (see Appendix C. Changes in Collaborations Among Organizations for details of the survey methods) to collect data for the interorganizational network analysis. Among the 174 stakeholder respondents who completed a question asking about how the UC changes have affected access to care, 65% indicated that they felt the changes had improved access to care. Another 26% felt that the changes had no meaningful impact on access to care, while 9% thought the changes had reduced access to care (see Appendices C. Changes in Collaborations Among Organizations and F. Effects on Uncompensated Care for details).

CONCLUSIONS

Although there are differences between this final evaluation report and the Health Management Associates (HMA) UC report (HMA, 2016) submitted this summer, both reports arrived at similar conclusions (Appendix F, Table 6). After initial adjustments in the first year (from Demonstration Year 1 to Demonstration Year 2), estimated UC costs remained relatively stable from Demonstration Year 2 to Demonstration Year 4 (2% increase) at about $7.3 billion. During this time, both DSH and UC payments dropped, which has led to continued increase in hospital shortfall after all supplemental payments. As of FY2015, the UC pool supplemental payments covered only 50% of the estimated shortfall after DSH payments, with $2.8 billion remaining; accounting for the number of beds, public hospitals represented 55% of UC payments per bed and 52% of total shortfall after all payments per bed. The UC cost covered by the UC pool payments for these hospitals dropped from 84% to 52% during the Demonstration. Providers in Texas have received $6.2 billion in DSRIP payments in total from Demonstration Year 2 to Demonstration Year 4, but still need time to evaluate impact on UC cost from these projects. The majority of stakeholders felt that the changes in UC system improved access to care.

The financial stress on hospitals that provide substantial uncompensated care has been a longstanding source of concern about the ability of these hospitals to continue to provide care to the underserved in their communities while remaining financially viable (GAO, 2016). Under the ACA, there are plans for graduated cuts to the DSH supplemental payments that potentially will exacerbate this financial stress. The Demonstration was designed to slow down the growth in UC costs by improving disease prevention and management through managed care expansion and delivery system innovations. Analysis of UC cost data for FY2010 and FY2013 revealed that large urban public hospitals tended to have had both greater levels of total unreimbursed UC costs and had higher rates of growth in total unreimbursed UC costs compared to other hospitals. These results reflect in part the greater total population and population growth rate in urban areas compared to non-urban areas. Unfortunately, data were not available to observe trends in UC costs over the entire Demonstration period or the impact of provider-earned DSRIP funds. Due to the combination of delays in DSRIP project implementation and a 2-year lag inherent in UC cost reporting, no causal inferences can be made at this point about the impact of the Demonstration on UC costs. Hence, HHSC will need more time after the current 5-year period to measure the impact of the Demonstration on UC costs.

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APPENDIX A: ACRONYMS

Acronym Directory	
AAP	Adult Access to Preventive/Ambulatory Health Services
ACA	(Patient Protection and) Affordable Care Act
ACSC	Ambulatory Care Sensitive Conditions
AHRQ	Agency for Healthcare Research and Quality
B	Billion
BH	Behavioral Health
CAHPS®	Consumer Assessment of Healthcare Providers and Systems Survey
CAP	Children and Adolescents' Access to Primary Care
CAT	(Medicaid Program) Category
CEO	Chief Executive Officers
CFR	Code of Federal Regulations
CHF	Congestive Heart Failure
CHIP	Children's Health Insurance Program
CM	Case Manager
CMHC	Community Mental Health Center
CMS	Centers for Medicare and Medicaid Services
CNA	Community Needs Assessment
CQI	Continuous Quality Improvement
COPD	Chronic Obstructive Pulmonary Disease
CPS	Current Population Survey
CPT	Current Procedural Terminology
CY	Calendar Year
DADS	Texas Department of Aging and Disability Services
DID	Differences in Differences
DMO	Dental Managed Care Organization
DPH	Designated Public Hospital System
DSH	Disproportionate Share Hospital
DSHS	Texas Department of State Health Services
DSRIP	Delivery System Reform Incentive Payment
DY	Demonstration Year
ECHO	Experience of Care and Health Outcomes (Survey)
ED	Emergency Department
EHR	Electronic Health Record
EMR	Electronic Medical Record

EMS	Emergency Medical Service
EMT	Emergency Medical Technician
EMTALA	Emergency Medical Treatment and Active Labor Act
EPSDT	Early and Periodic Screening, Diagnostic, and Treatment (Program)
EQRO	External Quality Review Organization
ER	Experience Rebate
FFS	Fee-for-Service
FFY	Federal Fiscal Year
FPL	Federal Poverty Level
FSR	Financial Statistical Report
HB	House Bill
HCPCS	Healthcare Common Procedure Coding System
HEDIS®	Healthcare Effectiveness Data and Information Set
HHSC	Texas Health and Human Services Commission
HIE	Health Information Exchange
HPSA	Health Professional Shortage Area
HSC	Health Science Center
HSL	Hospital Specific Limit
IBNR	Incurred But Not Reported
ICD-9-CM	International Classification of Diseases, 9th Revision, Clinical Modification
ICF	Intermediate Care Facility
IDD	Intellectual and Developmental Disability
IGT	Intergovernmental Transfer
IHI	Institute for Healthcare Improvement
IT	(Outcome) Improvement Target
K	Thousand
LMHA	Local Mental Health Authority
LTSS	Long-Term Services and Supports
MCO	Managed Care Organization
M	Million
MMC	Medicaid Managed Care
MLR	Medical Loss Ratio
MRSA	Medicaid Rural Service Area
MUA	Medically Underserved Area
NAIC	National Association of Insurance Commissioners
NCQA	National Committee for Quality Assurance
NSA	Non-Stand-Alone
PBM	Pharmacy Benefit Manager
PCCM	Primary Care Case Management
PCMH	Patient Centered Medical Home

PCN	Patient Control Number
PCP	Primary Care Provider or Practitioner
PMPM	Per Member Per Month
POS	Place of Service
PPA	Potentially Preventable Admission
PPC	Potentially Preventable Complication
PQI	Prevention Quality Indicator
Q	Quarter
RC	Relational Coordination (Survey)
RD	Reporting Domain
RHP	Regional Healthcare Partnership
RQ	Research Question
RUCC	Rural-Urban Continuum Codes
SA	Stand-alone
SB	Senate Bill
SDA	Service Delivery Area
SF	Short Form
SFY	State Fiscal Year
SSI	Social Security Income
STAR	State of Texas Access Reform
STC	Special Terms and Conditions
SD	Standard Deviation
SW	Social Worker
TAC	Texas Administrative Code
TANF	Temporary Assistance for Needy Families
TMHP	Texas Medicaid and Healthcare Partnership
TP	Type Program
UBREV	Uniform Bill Revenue
UC	Uncompensated Care
UPL	Upper Payment Limit
USC	United States Code
USDA	United States Department of Agriculture
VDP	Vendor Drug Program
WHO	World Health Organization

APPENDIX B:
EXPANSION OF MEDICAID MANAGED CARE STATEWIDE

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BACKGROUND FOR EVALUATION GOALS 1 - 4

Medicaid is a jointly funded state-federal program that finances health insurance for low-income, pregnant women, children, disabled, and elderly Americans. Through the traditional healthcare payment model, known as fee-for-service (FFS), each state directly pays health care providers a fee for each unit of service provided. FFS can result in overutilization and lack of care coordination that may be harmful to beneficiaries and incur unnecessary costs (Chernew, 2010; Emanuel & Fuchs, 2008).

In 1993, Texas began reforming the Medicaid payment structure through the State of Texas Access Reform (STAR) managed care program in select urban areas of the state. In a managed care healthcare delivery model, a managed care organization (MCO) is paid a capped (or capitated) rate per month for each member enrolled. Therefore, the MCO has an incentive to have quality healthcare delivered in the most efficient way in order to minimize their risk of financial loss (Bindman, Chattopadhyay, Osmond, Huen, & Bacchetti, 2005). By September 2005, all Texas counties were served by either STAR or Primary Care Case Management (PCCM), a healthcare delivery model similar to Medicaid managed care, except the medical home and health care services are provided by a network of primary care and/or other health care providers, instead of a MCO. By State Fiscal Year (SFY) 2014, approximately 80 percent of the state's Medicaid population was enrolled in some form of managed care (Texas Health and Human Services Commission, 2015a).

On March 1, 2012, the Demonstration expanded Medicaid Managed Care (MMC) statewide, replacing PCCM in predominantly rural areas, carving-in prescription drug benefits, non-behavioral health inpatient hospitalizations, and transforming the Children's Medicaid Dental program from fee-for-service to MMC.

STAR Program

The STAR MMC program provides healthcare services primarily to low-income children, families, and pregnant women. Under the Demonstration, STAR was expanded statewide to replace the PCCM service delivery model. In March 2012, STAR went into effect in the Hidalgo service delivery area (SDA), and the Central, Northeast, and West Medicaid Rural Service Areas (MRSAs) (Figure 1). Pharmacy benefits once offered through the Vendor Drug Program are now included in MMC capitation rates.

STAR+PLUS Program

The STAR+PLUS MMC program provides acute care services plus long-term services and supports (LTSS) by integrating primary care, pharmacy services, and LTSS for individuals who are age 65 or older or who have a disability. In March 2012, under the Demonstration, STAR+PLUS was expanded to the Hidalgo, El Paso, and Lubbock SDAs, replacing the PCCM Medicaid service delivery model (Figure 2). Inpatient hospitalizations benefits were carved in MMC capitation rates. In September 2014, the STAR+PLUS program was further expanded to the Central, Northeast, and West MRSAs (Figure 2).

Children's Medicaid Dental Program

In March 2012, dental managed care replaced the FFS delivery model for primary and preventive dental care. Children's Medicaid Dental program services are provided through MMC for most children and young adults through age 20. Members receive, through a primary dentist, routine preventive, diagnostic, and any necessary restorative and orthodontic services. Medicaid clients who are age 21 and over, reside in a Medicaid-paid facility (e.g., nursing home, state supported living center, etc.), or are STAR Health (MMC program for foster children) clients are not eligible to participate in the Children's Medicaid Dental program and continue to receive dental services through their existing service delivery models.

EVALUATION GOALS

As Medicaid beneficiaries and healthcare benefits shifted from PCCM/FFS to MMC, Evaluation Goals 1 through 4 utilized a pre-/post- evaluation design to examine the association of the MMC expansion on four aspects of health care: access, coordination, quality, and cost (Berwick, Nolan, & Whittington, 2008). This report addresses all required evaluation questions in the Special Terms and Conditions (STCs), included in the approved evaluation plan (Appendix G), and any additional amendments effective on or prior to September 2015 (Figure 3).

Four specific evaluation questions guided this portion of the evaluation (Evaluation Goals 1 through 4; STC 73.a.i):

Evaluation Goal 1: Evaluate the extent to which *access to care* improved through managed care expansion to new STAR and STAR+PLUS SDAs, dental services, and pharmacy services.

Demonstration foci included: access to prescription drugs, dental care for children, non-behavioral inpatient care, and adult access to preventive/ambulatory health service.

Evaluation Goal 2: Evaluate the extent to which *coordination of care* improved through managed care expansion to new STAR and STAR+PLUS SDAs.

Demonstration foci included: coordination of care among providers and service coordination.

Evaluation Goal 3: Evaluate the extent to which *quality of care* improved through managed care expansion to new STAR and STAR+PLUS SDAs, dental services, and pharmacy services.

Demonstration foci included: quality of dental care for children and quality of adult preventive and emergent care.

Evaluation Goal 4: Evaluate the extent to which *efficiency improved and cost decreased* through managed care expansion to new STAR and STAR+PLUS SDAs, and dental services.

Demonstration foci included increased utilization rates and an analysis of the experience rebate provision.

Figure 1. Service Delivery Areas (SDAs) for Texas STAR Program Before and After Managed Care Expansion on March 1, 2012
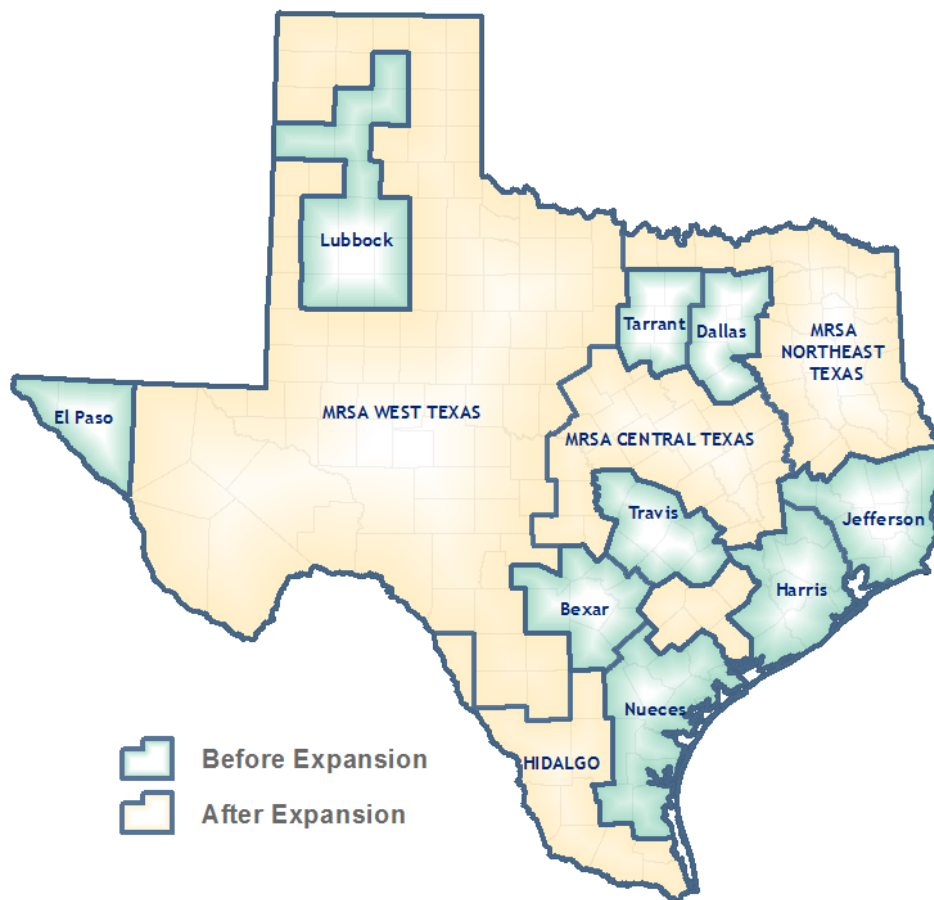
Figure 2. Service Delivery Areas (SDAs) for Texas STAR+PLUS Program Before and After Managed Care Expansions on March 1, 2012 and September 1, 2014
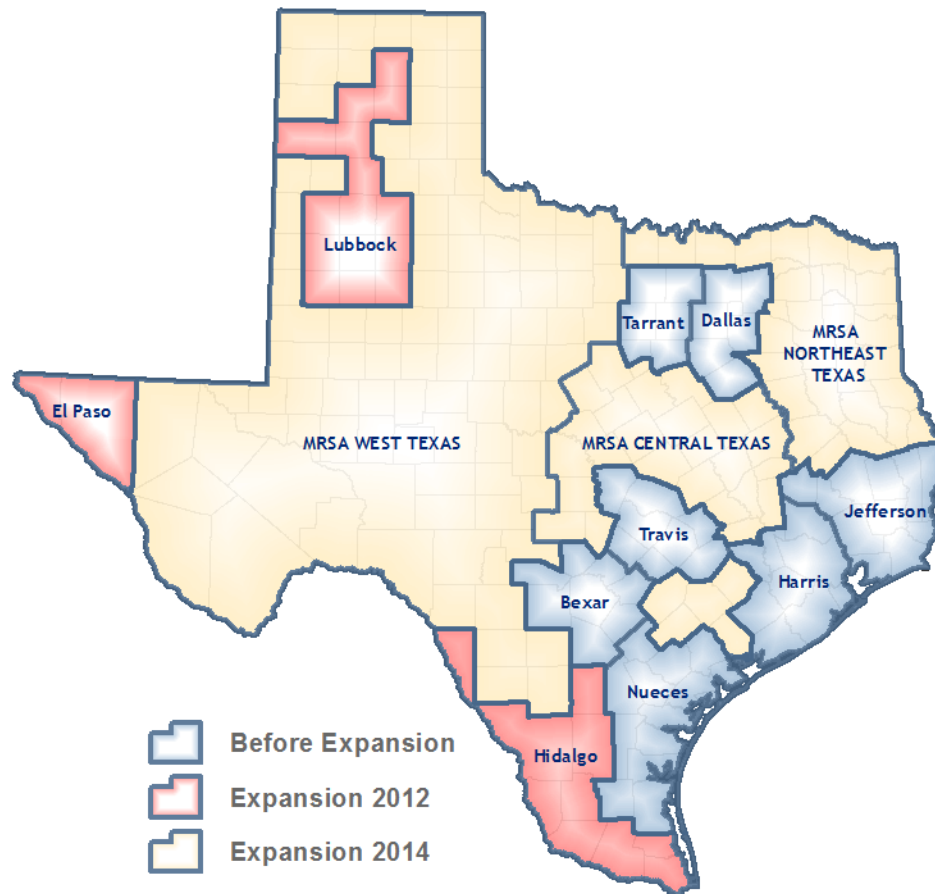
Figure 3. Intervention I Key Dates and Timeline for the Expansion of Texas Medicaid Managed Care

Amendment
STAR+PLUS expands to MRSA,
ICF/IDD clients,
MH case management/rehab added
September 1, 2014

Amendment
Medicaid Managed Care
(STAR Kids) expands
November 1, 2016

Medicaid Managed Care
(STAR/STAR+PLUS) expands,
PCCM eliminated
Additional services carved-in
March 1, 2012

Amendment
Nursing Facility services
Carved-in to STAR+PLUS,
Dual Demonstration
March 1, 2015

Texas 82nd Legislative
Session

Texas 83rd Legislative
Session

Texas 84th Legislative
Session

Texas 85th Legislative
Session

| FFY 2009 | FFY 2010 | FFY 2011 | FFY 2012 | FFY 2013 | FFY 2014 | FFY 2015 | FFY 2016 | FFY 2017 | FFY 2018 |

Pre- Demonstration Years

Demonstration Years

15-month extension

Texas 1115(a) Final Evaluation Report
Intervention I (Pre-/Post- Design)

FFY – Federal Fiscal Year
ICF/IDD – Intermediate care facility/
Individuals with an intellectual
disability or related conditions
MH – Mental health
MRSA – Medicaid Rural Service Area
PCCM – Primary Care Case Management

Literature Review

Evaluation Goal 1: Access to Care

Research assessing MMC's impact on access to care often explores utilization of healthcare services. A study of California's transition from FFS to MMC found a 33% lower rate of hospitalizations for ambulatory care sensitive conditions for all Temporary Assistance to Needy Families (TANF) eligible Medicaid beneficiaries (Bindman, Chattopadhyay, Osmond, Huen, & Bacchetti, 2005), suggesting that MMC may be associated with improvements in access to ambulatory care.

Conceptualizing and operationalizing healthcare access is essential for health policy to monitor the effectiveness of various programs and/or interventions in improving health outcomes (Donabedian, 1980). Although there is no systematic definition or measurement of healthcare access, Donabedian (1980) defines accessibility of care as the ease with which care is initiated and maintained. Anderson (2007) proposed a conceptual framework of healthcare access which focuses on describing and measuring the relationships between the health service system, the population served, and health outcomes. One of the most measured relationships is between access to ambulatory care and avoidable hospitalization due to ambulatory care sensitive conditions (ACSC) (Rosano et al., 2012).

The concept of 'access to care' was measured by examining trends in children and adolescent access to primary care services for STAR program clients, adult access to preventive/ambulatory health services for STAR+PLUS program clients, dental utilization for children and youth, and rates of inpatient hospital stays for STAR+PLUS program eligibles. If MMC has an impact on access to care, then post-expansion outcomes will have a statistically significant slope different than the pre-expansion trend.

Access to care measures for dental utilization were based on recommended dental visits from the American Dental Association, the American Academy of Pediatric Dentistry, and the American Academy of Pediatrics. All of the professional organizations recommend a child have a dental visit by 12 months of age and receive screening and preventive care visits at regular intervals thereafter (American Academy of Pediatric Dentistry, 2013). A dental visit prior to turning one is an influential predictor of the child's future oral health. It connects the infant with a dental home and allows the dentist to provide parental education, such as dietary and dental hygiene recommendations. A dental visit before 12 months of age is also associated with reduction in costs due to subsequent restorative or emergency visits (Savage, Lee, Kotch, & Vann, 2004). Compliance with recommended dental visits is one indicator of the quality of dental care received. Since Healthy People 2010, oral health has been included to measure and

highlight the importance of preventive dental care.[6] Healthy People 2020 (HP2020) oral health objectives include increasing the proportion of children accessing the oral health care system in the past year to 49 percent. Emphasis on preventive dental care is based on the public health principle that preventing disease is less costly in the long-term and reduces the need for future invasive treatments (Runyan, 1998).

Evaluation Goal 2: Care Coordination

The nature of care coordination is to promote coordination of social support and medical services across different organizations and providers (United Hospital Fund, 2014).

Grabowski (2014) describes a conceptual framework containing multiple levels of payers and providers in healthcare (see Figure 4), where the coordination of care at the financing level relates directly to the financing and payment of those services. The financing level consists of federal government, state government, and healthcare providers. Coordination at the financing level leads to integrated policies and cost shifting that may introduce stronger incentives to improve patient care coordination at the delivery level.

The delivery level consists of healthcare providers, clients, and caregivers. At the delivery level, the coordination of financing and payment can be thought of as necessary, but not sufficient, conditions for the coordination of health services. Examples of care coordination at the delivery level are case management, patient education, and shared patient health information (McDonald, Schultz, Albin, Pineda, Lonhart, Sundaram, & Malcolm, 2010).

Since the Demonstration impacted selected segments of the financing level, the evaluation focused on the delivery level to evaluate the impact of care coordination on MMC clients. Care coordination includes working with individuals and families to develop a plan of care to meet the needs of the individual and coordinate the services of the managed care organization (MCO) through "case management, team-based care models, patient education, management of care transitions, communication protocols for providers, and shared clinical and social information" (Texas Health and Human Services Commission, 2015a).

Although there is no systematic definition or measure, the goal of the evaluation is to quantify both the direction and the size of the effects of care coordination. Care coordination was operationalized as the receipt of targeted case management among adult STAR+PLUS clients with serious persistent mental illness (SPMI) continuously enrolled for 11 or 12 months. The impact of care coordination was measured through the number of SPMI hospital admissions.

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[6] http://www.healthypeople.gov/

Figure 4. Conceptual Framework: The Role of Financing and Healthcare Delivery in Care Coordination
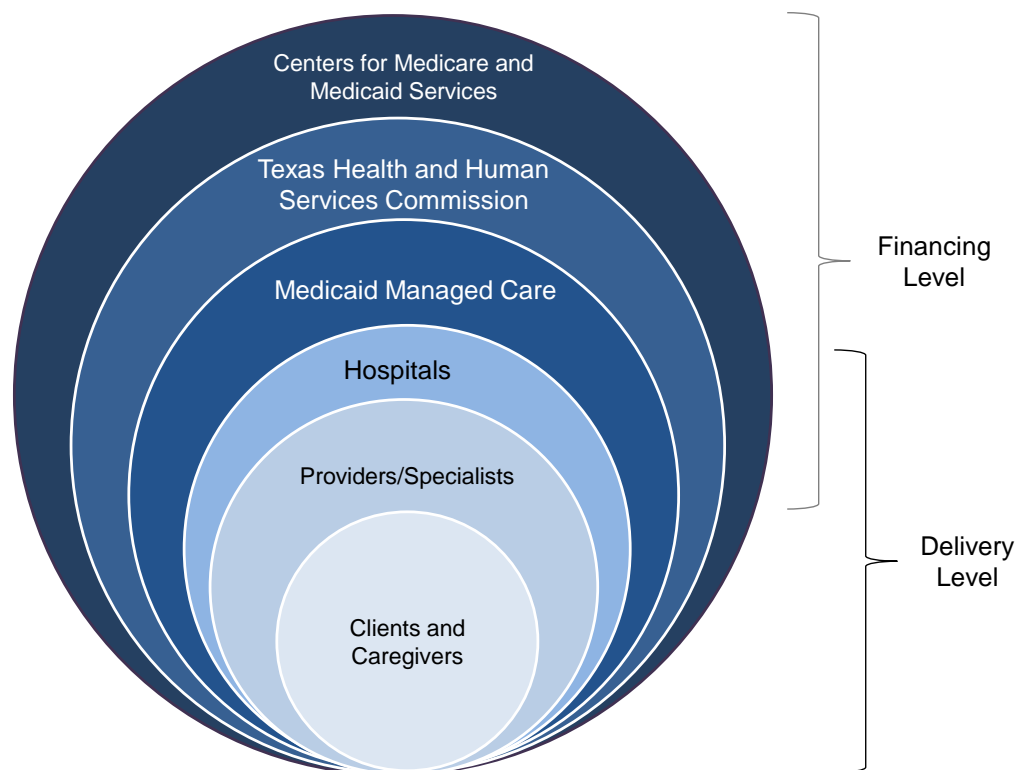
Evaluation Goal 3: Quality of Care

As state governments enroll more seniors and individuals with disabilities who have complex health needs into Medicaid managed care (MMC), interest exists in whether an MMC model can impact quality of care. One measure of quality is the prevention of visits to the ED and admissions to the hospital that were potentially avoidable with better access to care in the outpatient setting (Agency for Healthcare Research and Quality). Chronic medical conditions deemed "ambulatory care sensitive conditions" (ACSC), such as asthma and diabetes, are considered relatively controllable with effective and timely outpatient management. ACSC were developed from a set of medical conditions called "sentinel health conditions," identified by Rutstein and colleagues in the mid-1970's (Porell, 2001). Prior research has shown greater access to primary care is associated with fewer hospitalizations for ACSCs (Falik, Needleman, & Wells, 2001; Bindman, Chattopadhyay, Osmond, Huen, & Bacchetti, 2005). Research on the California MMC program has found that clients in MMC have lower rates of hospitalizations for ACSCs as compared to clients in FFS (Bindman, Chattopadhyay, Osmond, Huen, & Bacchetti, 2005).

The Agency for Healthcare Research and Quality (AHRQ) considers ACSCs as "conditions for which good outpatient care can potentially prevent the need for hospitalization or for which early

intervention can prevent complications or more severe disease."[7] Analysis of preventable hospitalizations has become an established tool for assessment of primary care access and quality. Higher hospital utilization from ACSCs may reflect inadequacies in the healthcare provided to the patient in multiple settings, including inpatient and outpatient facilities and clinics.

While quality measures are widely used by insurance companies, including Medicaid MCOs, there is scarce research and varied results as to whether MMC improves quality as compared to FFS and PCCM (Sparer, 2012). In a review of existing literature regarding MMC, results of improved quality in MMC were mixed (Sparer, 2012). One reason may be that healthcare occurs within a complex system that is not fully controlled by the MCOs (Donabedian, 2005; Paradise & Garfield, 2013; Sparer, 2012).

The same focus on prevention occurs in MMC for dental services. While less mature than MMC for physical health (Hunt & Aravamudhan, 2014), MMC for oral health follows a similar model with a focus on prevention and use of incentive payments (Snyder, 2015).

This evaluation measured the impact of MMC on quality of care by examining pre- and post-expansion trends of potentially preventable: hospital admissions, readmissions, and emergency department visits. The carve-in of pharmacy benefits was examined using hospital admissions due to asthma or acute serious persistent mental illness (SPMI) events. Finally, quality of dental care was measured through trends in utilization of diagnostic, preventive, restorative, orthodontic, and other services. Analyzing quality of care outcomes before and after MMC expansion in Texas provides an opportunity to compare quality of care for Medicaid clients under different healthcare delivery models.

Evaluation Goal 4: Efficiency and Cost

While the literature provides mixed results as to whether MMC reduces costs of patient care, there are measures in place at the MCO level to promote quality patient care while containing costs. The per member per month capitation structure of managed care provides an incentive for MCOs to provide more low-cost preventive care than more expensive hospital care, where possible, to avoid financial loss. There are policies in place to ensure that MCOs spend the majority of the capitated payment on patient care, rather than on administrative costs, or retain for profit. The Medical Loss Ratio (MLR) is a component of the Patient Protection and Affordable Care Act (ACA) (2010), and the Experience Rebate (ER) is a financial model specific to Texas.

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[7] http://www.qualityindicators.ahrq.gov/Modules/PQI_TechSpec.aspx

Both of these policies were designed to ensure MCOs spend a minimum percentage of the capitated payment on patient care and limit MCO profit.

The capitated payment MCOs receive for each member each month includes the moneys necessary to provide direct care, cover administrative expenses, and include a moderate amount of profit. MCOs are required to use most of the capitated payments on medical services (direct care and health care quality improvement activities) (45 C.F.R. § 158.210). Examining the impact of the Demonstration on cost of care and comparing MCO expenses under the MLR versus the ER methodologies will provide Texas with valuable information about program successes and opportunities for improvement.

Medical Loss Ratio

The MLR provision of ACA requires small-sized insurance companies to spend at least 80 percent of their premium income on healthcare claims and quality improvement activities, leaving the remaining 20 percent for administration, marketing, and profit (45 C.F.R. § 158). The MLR threshold is higher for large group plans, which are required to spend at least 85 percent of premium dollars on healthcare claims and quality improvement. However, the MLR does not cap administrative expenses.

A potential unintended consequence of using an MLR target is that it may not provide enough incentive to the MCOs to contain costs by investing in additional infrastructure. For example, investment in a new utilization review program designed to identify incidences of fraud, waste, and abuse would have the effect of increasing administrative cost and reducing unnecessary medical expense. The effect of the investment could change the ratio of direct to indirect costs, which might result in a lower MLR. This lower MLR could then lead to a financial penalty for the MCO.

Experience Rebate

In comparison, the ER model was designed to maximize the amount of excess profits returned to the State while ensuring that MCOs provide a high level of direct care to their members. Texas uses historical Texas Medicaid claims and encounters data over several rate periods to set an actuarially sound capitation rate for each of its managed care programs, including a two percent risk margin (profit) target. When an MCO's profit exceeds three percent, the MCO is required to return a portion of those profits to the State under the ER model.

Texas requires the MCOs to develop a network of providers and an administrative infrastructure to support the needs of their members. The administrative funds included in the calculated capitation rate should provide sufficient funding for the administrative infrastructure.

In an MLR provision, when calculating the proportion of the capitated rate used on direct care, the MCOs can deduct from their net revenue calculation the total administrative expenses. Under the ER model, Texas limits the allowable administrative costs for each MCO. MCOs are free to spend above the cap, but only administrative expenses up to the cap will be deducted when determining the percent of profit earned by the MCO. In the Demonstration, Texas proposed that by setting a limit on the amount of money spent on administrative expenses, the

ER model increases the calculated profit and therefore requires Texas Medicaid MCOs to return more profit to Texas than would have been returned under the MLR.

EVALUATION DESIGN

Given the Demonstration expansion activities described previously, this evaluation includes measures on short-term outcomes (process indicators), intermediate outcomes (health outcome indicators), and cost outcome indicators (see Figure 5). Process indicators include measures of care coordination, and preventive care-specific clinical processes shown to be associated with favorable clinical outcomes. Health outcome measures include clinical outcome measures associated with process indicators. Finally, cost outcome indicators include measures associated with process and health outcome indicators and spending requirements/profit restrictions imposed on MCOs. These process, health, and cost indicators directly relate to the four evaluation goals.

Figure 5. Logic Model for Texas Medicaid Managed Care Expansion
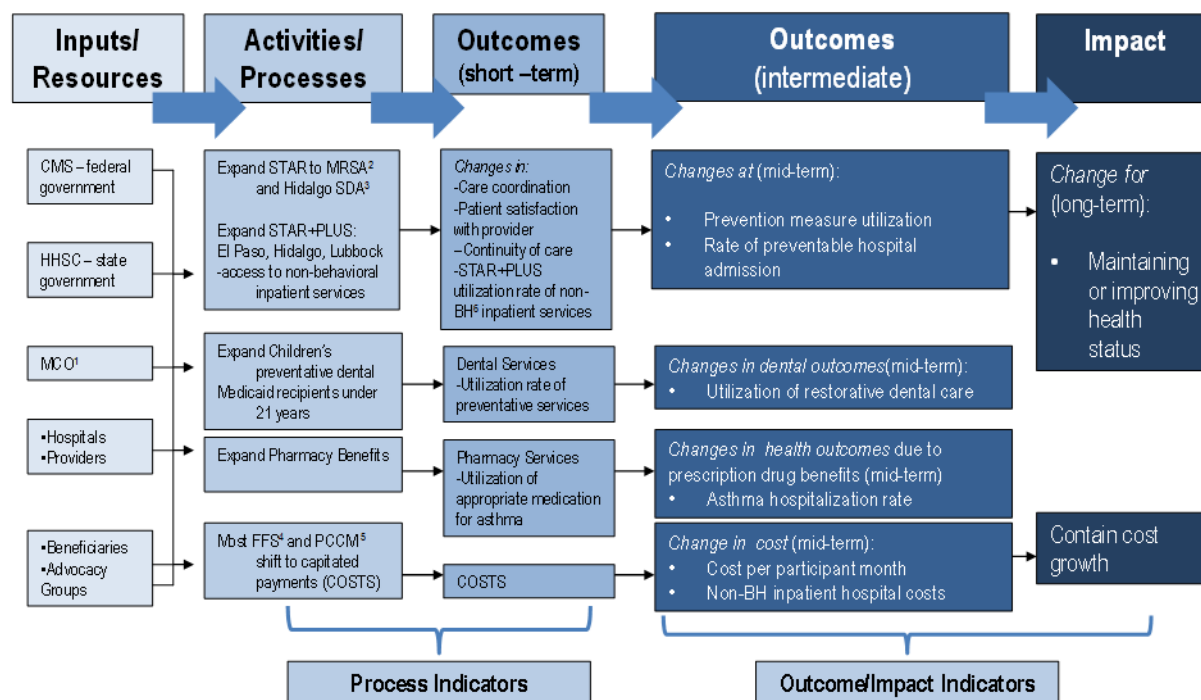
[1] MCO = Managed Care Organization, [2] MRSA = Medicaid Rural Service Area, [3] SDA = Service Delivery Area, [4] FFS = Fee-for-Service, [5] PCCM = Primary Care Case Management, [6] BH = Behavioral Health

Over the five-year demonstration period, Texas anticipated changes to process outcomes first and then intermediate outcomes in later demonstration years. By monitoring process outcomes, Texas expected to reduce the likelihood of false negative results due to the limited time for detecting any changes in health outcomes.

Even though the overarching long-term impact is to maintain or improve health outcomes while containing cost growth, Texas focused on evaluating each process and associated health outcome. The advantage of this strategy enabled Texas and CMS to examine differences among specific health benefits (e.g., non-behavioral health hospitalizations) to identify which benefit(s) may be making the greatest positive impact and which health benefit(s) needs improvement.

METHODS

Measures were developed or adapted from validated sources to address each evaluation question and MMC program population. Table 1 lists each evaluation question, performance measure/indicator, program population, analytic approach to examine pre- post- expansion impact from MMC, and which evaluation goal the measure addresses. Table 41 in the supplementary materials provides details on the source of each performance measure and any adaptations to published measures.

Unless otherwise specified, the pre-Demonstration period is FFY 2009 through FFY 2011 and the post-Demonstration period is FFY 2012 through FFY 2015.

Table 1. Evaluation Questions, Performance Measures, and Analytic Approach

Evaluation Questions		Performance Measure/Indicator	Program Population	Analytic Approach	Evaluation Goal
Process Indicators	Did expansion of STAR to the Hidalgo SDA and STAR+PLUS to the El Paso, Hidalgo, and Lubbock, and MRSA SDAs impact access to care for the target population? (STC 73.a.i)	Children and Adolescent access to primary care (HEDIS® CAP-like) services	STAR eligible	Interrupted Time Series	Access to Care
		Adult access to preventive/ambulatory health services (HEDIS® AAP-like)	STAR+PLUS eligible	Interrupted Time Series	Access to Care
		Number of STAR+PLUS members who had inpatient hospital stays per 1,000 members	STAR+PLUS eligible	Interrupted Time Series	Access to Care
		Top ten diagnoses utilized during hospitalizations for STAR+PLUS members who had inpatient hospital stays	STAR+PLUS eligible	Descriptive Statistics	Access to Care
		Average number of miles from STAR+PLUS members to closest participating inpatient hospital in each new service area	STAR+PLUS eligible	Descriptive Statistics	Access to Care
	Has the carve-in of pharmacy benefits into capitated managed care impacted access to care for the target population? (STC 73.a.i.a)	Percent of members with major depression adherent to their medications (HEDIS® AMM-like)	STAR and STAR+PLUS eligible	Descriptive Statistics	Access to Care
		Percent of members with persistent asthma who have an asthma medication ratio of 0.50 or greater (HEDIS® AMR-like)	STAR and STAR+PLUS eligible	Descriptive Statistics	Access to Care
		Percent of members with schizophrenia adherent to their medications (HEDIS® SAA-like)	STAR and STAR+PLUS eligible	Descriptive Statistics	Access to Care
	Has the utilization of preventive (and care coordination) of dental services for children age 20 years and younger changed as a result of the expansion? (STC 73.a.i.b)	Percent of children's Medicaid dental services members who receive at least one diagnostic dental service in one calendar year	Children age 0 - 20 years	Descriptive Statistics	Access to Care
		Percent of children's Medicaid dental services members who receive at least two dental check-ups in one calendar year	Children age 0 - 20 years	Descriptive Statistics	Access to Care
		Percent of children's Medicaid dental services members who receive at least one fluoride treatment in one calendar year	Children age 0 - 20 years	Descriptive Statistics	Access to Care

	Evaluation Questions	Performance Measure/Indicator	Program Population	Analytic Approach	Evaluation Goal
Process Indicators	Did the expansion of STAR and STAR+PLUS to the new service delivery areas impact quality of care for the target population? (STC 73.a.i)	Percent of survey respondents who rated their health plans with a 9 or 10 (CAHPS®)	STAR and STAR+PLUS	Descriptive Statistics	Quality of Care
	Did the expansion of STAR and STAR+PLUS to the new service delivery areas impact care coordination for the target population? (STC 73.a.i)	Percent of survey respondents who felt their providers were well-informed (CAHPS®)	STAR and STAR+PLUS	Descriptive Statistics	Care Coordination
		Percent of Medicaid clients with existing patient claims	STAR+PLUS eligible	Interrupted Time Series	Care Coordination
Intermediate Health Outcomes	Did the carve-in of behavioral health services into STAR and STAR+PLUS impact care coordination as compared to behavioral health services being carved-out in the North STAR program? (STC 73.a.i.e)	Number of members with Serious Persistent Mental Illness receiving Mental Rehabilitative Services Ages 03 - 64	STAR and STAR+PLUS eligible	Difference In Difference	Care Coordination
		Number of members with Serious Persistent Mental Illness receiving Targeted Case Management Ages 03 - 64	STAR and STAR+PLUS eligible	Difference In Difference	Care Coordination
	Have dental MCOs reduced therapeutic dental care to the target population (children) over the demonstration period? (STC 73.a.i.b)	Number of members who received restorative dental services per 1,000 members	Children age 0 - 20 years	Descriptive Statistics	Quality of Care
	Have STAR and STAR+PLUS impacted preventable ER visits and hospitalizations over the demonstration period for the target population? (STC 73.a.i)	Number of preventable hospital admissions per 1,000 members	STAR STAR+PLUS eligible	Interrupted Time Series	Quality of Care
		Number of preventable emergency department visits per 1,000 members	STAR and STAR+PLUS eligible	Interrupted Time Series	Quality of Care
		Number of preventable hospital readmissions per 1,000 members	STAR and STAR+PLUS eligible	Descriptive Statistics	Quality of Care
	Has the carve-in of pharmacy benefits into STAR and STAR+PLUS impacted the number of hospital admissions due to an acute asthmatic or SPMI event? (STC 73.a.i.a)	Number of asthma hospital admissions per 100,000 members	STAR and STAR+PLUS eligible	Descriptive Statistics	Quality of Care
		Number of SPMI hospital admissions per 100,000 members	STAR and STAR+PLUS eligible	Descriptive Statistics	Quality of Care

Evaluation Questions		Performance Measure/Indicator	Program Population	Analytic Approach	Evaluation Goal
Intermediate Health Outcomes	Did the carve-in of behavioral health services into STAR and STAR+PLUS impact hospitalizations as compared to behavioral health services being carved out in the North STAR program? (STC 73.a.i.e)	Number or likelihood of hospitalizations of STAR and STAR+PLUS members, respectively, with Serious Persistent Mental Illness who received Targeted Case Management	STAR and STAR+PLUS eligible	Difference In Difference	Quality of Care
	Did the carve-in of nursing facilities into STAR+PLUS impact quality of care?	Rate of inpatient hospitalizations per 1,000 nursing facility clients	STAR+PLUS	Descriptive Statistics	Quality of Care
Cost Outcomes	How does Texas' Experience Rebate compare to Medical Loss Ratio regulation as a strategy for ensuring that managed care plans spend an appropriate amount of their premium revenue on medical expenses? (STC 73.a.i.c)	Amount of premium dollars returned to HHSC	STAR and STAR+PLUS eligible	Descriptive Statistics	Cost of Care
	Are there changes that could be made to the Experience Rebate provision or the Medical Loss Ratio regulation to improve upon the intended purpose of either mechanism? (STC 73.a.i.c)	Amount of premium dollars returned to HHSC	STAR and STAR+PLUS eligible	Descriptive Statistics	Cost of Care

Study Population

The study population collectively refers to the pre-expansion STAR- and STAR+PLUS-eligible clients and the post-expansion STAR and STAR+PLUS clients. The post expansion STAR and STAR+PLUS inclusion/exclusion criteria were used to identify individuals who would have been included in STAR or STAR+PLUS before the MMC expansion, had those programs been available in their respective SDAs. Inclusion criteria for the STAR and STAR+PLUS population were determined according to the Medicaid Population Eligibility Criteria (Appendix M in the Maximus Medicaid Managed Care and CHIP Joint Interface Plan (2015)). The member-level enrollment files were used to obtain data regarding Medicaid clients. Initial queries pulled all Medicaid clients from FFY2008 through FFY2015.

STAR Program

The STAR population is limited to Medicaid Category 2, meaning they qualified for Medicaid due to low-income. Specific program types comprise the STAR population, including programs for children, low-income families, pregnant women, and transitional Medicaid.

Clients enrolled in STAR in error, those with eligibility under investigation, and clients enrolled in both Medicaid and Medicare were excluded from the STAR population. Additionally, children who ever received Medicaid services through STAR Health, an MMC program for children in foster care, were excluded from the STAR population for evaluation purposes.

STAR+PLUS Program

Medicaid clients were identified as STAR+PLUS eligible if they were categorized as aged, blind, or disabled from FFY2009 through FFY2015 and resided in the Hidalgo, Lubbock, or El Paso SDAs, as well as the Central, Northeast, and West Medicaid Rural Service Areas (MRSAs). Further, the STAR+PLUS population is comprised of individuals in specific program types, including programs for SSI and SSI-related recipients, and individuals requiring medical assistance.

Members who were eligible for both Medicaid and Medicare (i.e., dual-eligibles) were excluded[8]. Although dual-eligible members represent the majority of STAR+PLUS enrollees for each SDA, data regarding aspects of their care covered by Medicare (e.g., hospitalizations and prescription drugs) were unavailable to HHSC. Therefore the evaluation was conducted with Medicaid-only clients so that utilization patterns were less likely to be underestimated.

Enrollment

The client-level enrollment files are considered to be final because all client enrollment data are updated retroactively; the files consist of one row per client per month of enrollment.[9]For any given year that a client is in Medicaid, they may have one to twelve rows in the file, depending on the number of months they were enrolled; each month of enrollment counts as one member-month. To determine the number of clients in the program population per year and SDA, a count of unique clients was utilized, regardless of the number of months the client was enrolled during that year.

The length of continuous enrollment represents the longest single period of continuous enrollment in Medicaid during the measurement year (FFY: October through September). For example, if a client was enrolled in Medicaid November through April (six months), not enrolled in May and June, but then re-enrolled July through September (three months), their longest period of continuous enrollment was six months.

Demographics

As described above, Medicaid clients were listed for each month of enrollment in the member-level enrollment files. Given this, demographic information such as gender, age, race/ethnicity,

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[8] For the six STAR+PLUS SDAs described in this evaluation, 61% to 63% of the population was excluded from analyses because they were deemed dual-eligible over the evaluation study period.
[9] The Eight-Month Eligibility File contains monthly enrollment data for Medicaid clients. The file lags eight months behind the current month and reflects changes in Medicaid eligibility applied retroactively.

and county was recorded each month. To determine the demographic characteristics of the program population, the gender, age, race/ethnicity, and county as of the first month of enrollment for each FFY were utilized. Tables 42 through 51 provide demographic characteristics for STAR and STAR+PLUS programs by each expanded service delivery area from FFY 2009 to 2015.

Data

Collected administrative data used to examine the impact of the MMC program expansion statewide for the final report come from four sources:

- **FFS Claims and MMC Encounter Data.** FFS claims and MMC encounter data have been processed by Texas Medicaid and Healthcare Partnership (TMHP) since January 1, 2004. TMHP performs internal edits for data quality and completeness. The member-level claims/encounter data contain the Current Procedural Terminology (CPT) codes and the International Classification of Diseases, 9th Revision (ICD-9-CM) codes, place of service (POS) codes, and other information necessary to calculate the quality of care indicators. There is a six-month time lag for claims and encounter data. Prior analyses with Texas data showed that, on average, over 96 percent of the claims and encounters are complete by that time period.
- **Member-level enrollment files -** The enrollment files contain information about the person's age, gender, race/ethnicity, county, the MCO in which the member is enrolled, and the number of months the member has been enrolled in the program.
- **Member-level pharmacy data -**The member-level pharmacy data contain information about filled prescriptions, including the drug name, dose, date filled, number of days prescribed, and refill information.
- **Consumer Assessment of Health Plans Survey (CAHPS)®** - CAHPS® surveys were developed by the Agency for Healthcare Research and Quality (AHRQ) to standardize patient surveys that can be used to compare results over time. These surveys ask patients to report on their experiences with a range of health care services at multiple levels of the delivery system and Texas CAHPS® participants are selected from a random sample of members and stratified by health plan. To be eligible for survey participation, member must have been enrolled in the STAR or STAR+PLUS program for nine months or longer. Members who are eligible for both Medicaid and Medicare, and members who participated in the previous fiscal years' survey are excluded. Since October 1995, Texas has contracted with an External Quality Review Organization (EQRO), the University of Florida, Institute for Child Health Policy to implement and report on CAHPS® data. Each year, a target total of survey participants is established and contacted by telephone. Results used in this evaluation are extracted and compiled from various technical appendix documents and are available upon request.

Statistical Analysis

A pre- and post- study design was used to evaluate the Demonstration's expansion of MMC programs and benefits into new SDAs. The maps (Figures 1 and 2) show the managed care landscape in Texas before and after MMC expansion. Unless indicated, federal fiscal year (FFY) is used as the analysis period because they correspond with demonstration years (DY) (October 1 - September 30).

The overall analytic approach entailed two primary comparisons:

- Comparison of outcomes pre- and post- expansion by service delivery area
    - Pre-Expansion (FFYs 2009 to 2011) – Data collected before the MMC expansion will provide baseline data. Baseline data are ideally defined as data 3-years prior to MMC expansion (under FFS system or PCCM).
    - Post-Expansion (FFYs 2012 to 2015) – This includes data collected by DY after MMC expansion.
- Comparison of outcomes in expanded service areas to existing MMC service areas

The evaluation is structured in this manner due to the local variability among each expanded service area in terms of demographics, providers, hospitals and other healthcare resources, and contextual factors.

Descriptive Trend Analyses

This evaluation encompassed entire eligible populations from Texas' Medicaid programs and benefits. No samples were taken from the populations, and as a result, any changes pre- and post-Demonstration represent population parameters. Therefore, descriptive trend analyses describe the time series with aggregated data in order to identify systematic patterns.

Interrupted Time Series Method

Interrupted Time Series (ITS) analysis uses aggregate data collected over equally spaced intervals before and after a policy change. A key assumption of ITS is that data trends before the policy change can be extrapolated to predict trends had the policy change not occurred (see Figure 6). If MMC had an impact on an outcome, the post- expansion trend will have a statistically significant slope that is different than the pre-expansion trend. When properly executed, ITS is a valuable method to evaluate the success, failure, or unintended consequences of health care policy on outcomes (Lagarde, 2012). However, given the serial nature of ITS data, autocorrelation, nonstationarity, and seasonality need to be considered. Failing to assess and correct for autocorrelation, nonstationarity, and seasonality can lead to biased results (Wagner, Soumerai, Zhang, & Ross-Degnan, 2002). A key strength of ITS methodology is that a control site is not required, provided a robust method of measuring the effect of an intervention such as when randomization or identification of a control group are impractical' (Grimshaw, Alderson, & Bero, 2003). Identifying a control site was difficult when evaluating MMC, given the geographic and demographic diversity in Texas and the fact that many programs were expanded statewide in 2012.

For performance measures using ITS, the basic segmented regression model with one change point or intervention was specified as:

$$Y_t = \beta_0 + \beta_1 * \text{time} + \beta_2 * \text{MMC expansion} + \beta_3 * \text{postslope} + \varepsilon_t$$

From the basic statistical model, β_0 reflects the baseline level of the outcome at the beginning of the pre-Demonstration period; β_1 estimates the trend before MMC expansion; β_2 estimates the immediate impact of MMC expansion; and β_3 reflects the change in trend after MMC expansion.

To ease interpretation, ITS results are presented as: baseline level, trend before MMC expansion, level change after MMC expansion, and trend after MMC expansion.

Figure 6. Example of Interrupted Time Series
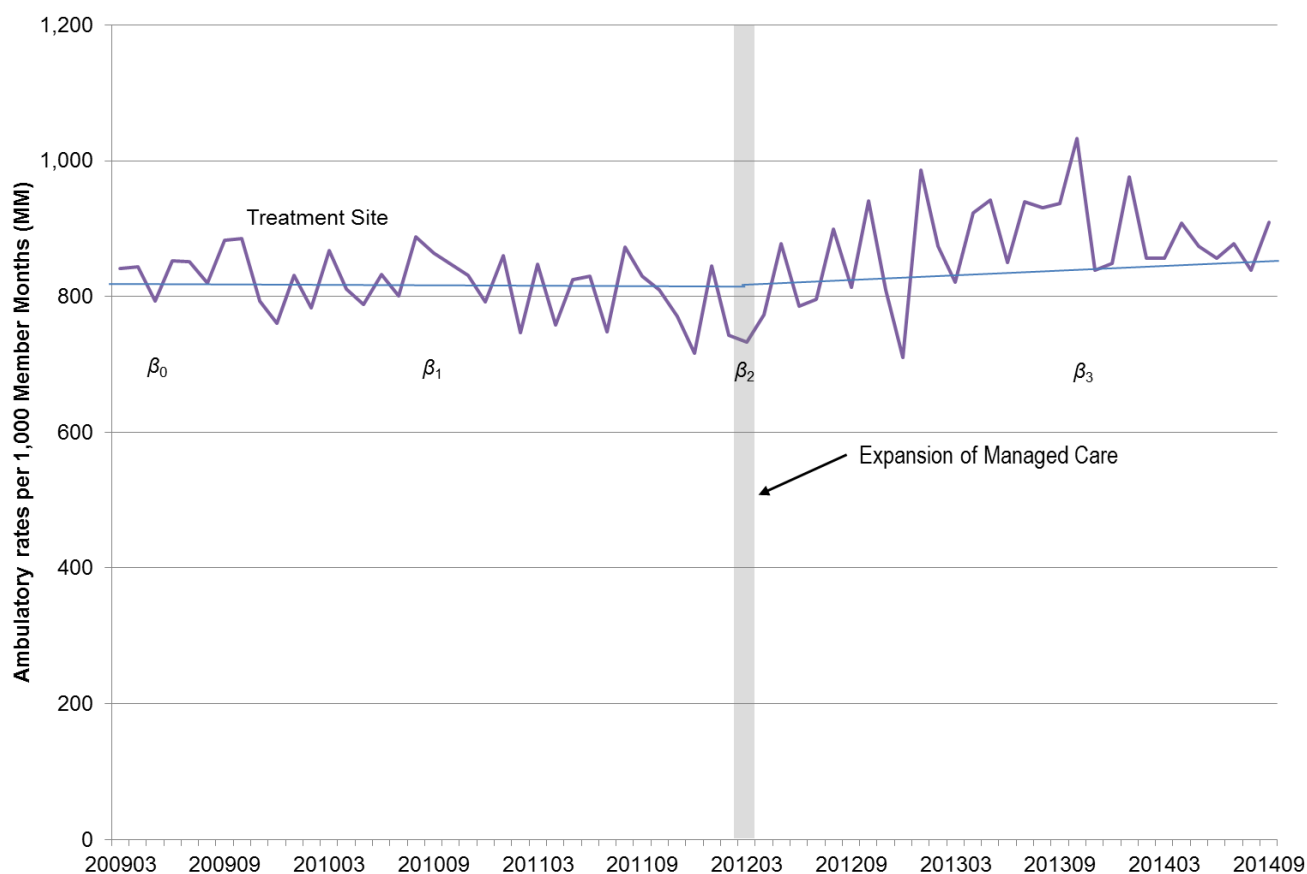
Difference-In-Difference Method

In contrast to ITS, which analyzes trends over time, difference-in-difference (DID) uses panel data to measure differences between the treatment site/group and control site/group (see Figure 7). Although DID is intended to mitigate extraneous factors (e.g., environmental contexts and contemporaneous policy initiatives) and selection bias, depending on how the treatment group is chosen, DID may still be vulnerable to certain biases (e.g., mean regression, reverse causality, and omitted variable bias).

Difference-in-difference (DID) method estimates the effect of a policy change on an outcome by comparing the average change over time in the outcome measure for a treatment site/group compared to the average change over time for a control site/group. Researchers can conclude a policy change had an impact if the outcome changed more for the treatment site/group than for the control site/group. If the differences are the same between the two groups, then there was no effect from the policy. The point estimates are derived from regression models rather than simple subtraction, allowing the estimates to be adjusted for other factors (e.g., patient

characteristics) that may differ between the groups. However, specification choices related to obtaining unbiased point estimates in DID models - including choice of control site/groups, the choice of pre-intervention time interval, and addressing violations to DID assumptions (e.g., parallel trends, and common shocks) have received scant attention in the literature (Dimick & Ryan, 2014).

Figure 7. Example of Difference-In-Difference Method
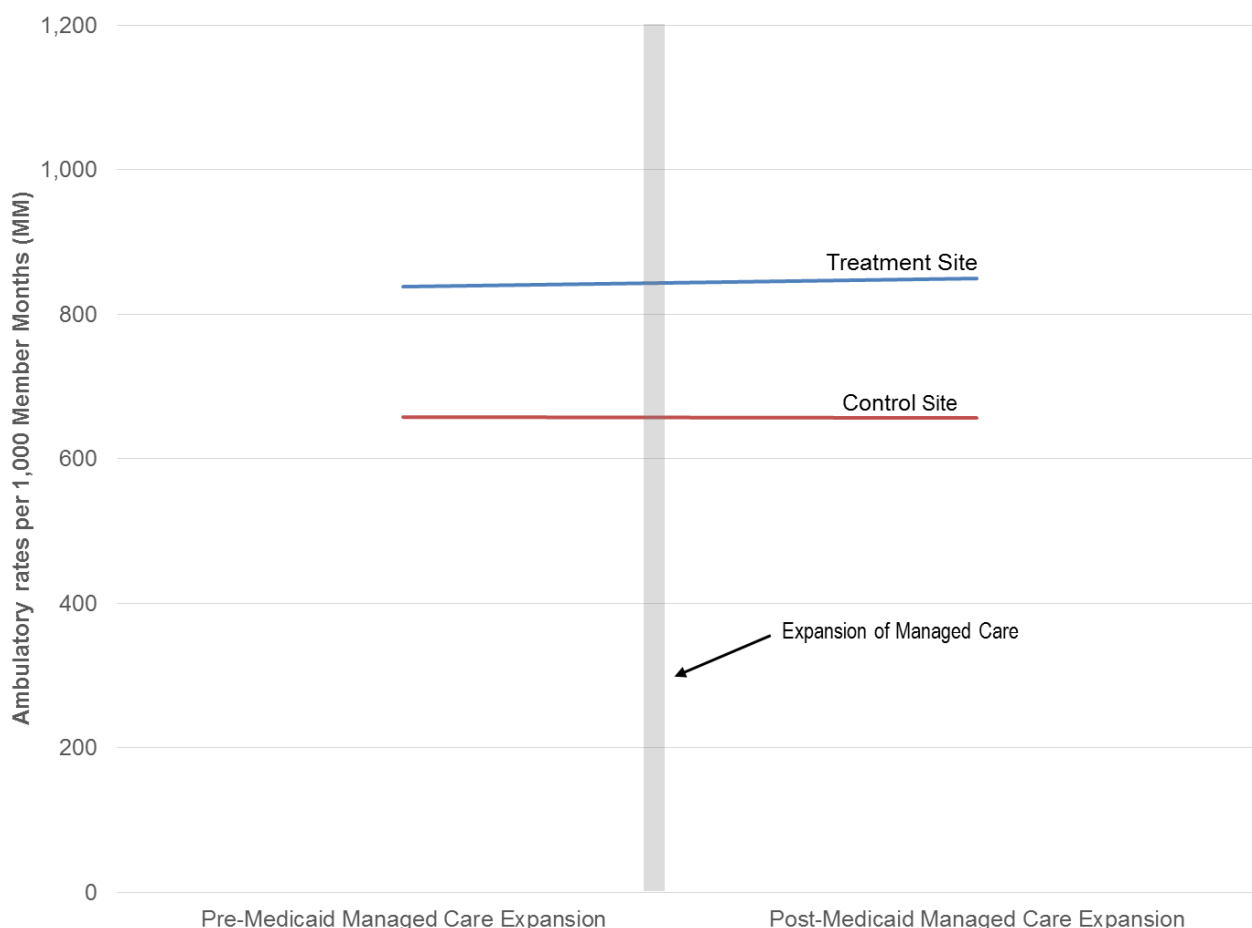
Additional Statistical Considerations

Inferential Statistical Models on Population Data

Parametric tests of hypotheses rely on sampling theory to produce estimates of likely error. If a researcher assumes a sample of a given size is selected from a population, knowledge of the systematic nature of sampling makes statistical testing, coefficient estimators, and standard errors meaningful. With a population, sampling theory is not relevant and statistical tests are not meaningful in the traditional sense because there is nothing to infer. While inferential statistical analyses were performed for ITS and Difference-In-Difference estimation models for performance measures and indicators described in Table 41, these programs and benefits include the entire populations, not samples, therefore any changes pre- and post-expansion represent the population parameter.

Sensitivity Analyses

Sensitivity analyses explored relationships in the Evaluation Logic Model (Figure 5), simplifying statistical models, and testing the robustness/model fit. Researchers conducted sensitivity analyses comparing alternative subgroups (e.g., Medicaid clients continuously enrolled 1 to 6 months versus clients continuously enrolled 7 to 10 months), time periods (e.g., STAR+PLUS expansion in 2012 and 2014), control site/groups, and alternative diagnoses groups.

STAR+PLUS Staggered Implementation

In March 2012, STAR+PLUS expanded to SDAs in El Paso, Hidalgo, and Lubbock replacing the traditional healthcare delivery models, FFS/PCCM. In MRSA SDAs, STAR+PLUS eligible clients received acute care services through a STAR MCO, and, if needed, continued to receive LTSS services through a 1915(c) waiver. In September 2014, STAR+PLUS expanded to MRSA SDAs, combining acute and long-term care services under one managed care program in those areas. STAR and STAR+PLUS both function as a risk-based managed care healthcare delivery models.

Texas' pre-/post- evaluation design specifically assessed the impact of the MMC healthcare delivery model and was not intended to measure the individual effects of STAR or STAR+PLUS. Everyone in the expansion SDAs eligible to be in STAR+PLUS was in an MMC program as of 2012, therefore the pre-/post- implementation date is March 2012 for all expansion areas. Since the healthcare delivery model is the same for STAR and STAR+PLUS (MMC), Texas' evaluation analyses did not need to account for the STAR+PLUS' staggered implementation in September 2014.

Reporting of Results

All calculations are presented to the nearest hundredths place and hypotheses tests were 2-sided and used a significance level of $P < .05$. All statistical analyses were conducted using SAS version 9.4 (SAS Institute Inc.). Statistical significance for ITS models is reported for all coefficient estimators, except the intercept. Geocoding—a process transforming a mailing address to a location on the Earth's surface and spatial analyses to determine the shortest distance between each member and the closest participating acute care hospital was calculated using ArcGIS® v10.4.1.

RESULTS

EVALUATION GOAL 1: ACCESS TO CARE

Access to Primary Care Services

Five measures were adapted or developed to examine whether the expansion of MMC impacted access to care for the target populations.

- **Children and adolescent access to primary care practitioners.** As MMC expanded through STAR, the number of children and adolescents who visited their primary care practitioner was measured and monitored. As members formerly receiving benefits under FFS or PCCM moved into STAR, it was expected that the number of members who visited their primary care practitioner would increase. The HEDIS® measure, children and adolescents' access to primary care (CAP), was adapted to measure this outcome. Table 41 in the Supplementary Materials describes adaptations.

- **Adult access to preventive/ambulatory health services.** As members formerly receiving benefits under FFS or PCCM moved into STAR+PLUS, it was expected that the number of members who received preventive or ambulatory health services would increase. The HEDIS® measure, adult access to preventive/ambulatory health services (AAP), was adapted to measure this outcome. Table 41 in the Supplementary Materials describes adaptations.

- **STAR+PLUS access to inpatient hospitalizations**. The carve-in of non-behavioral health inpatient services to STAR+PLUS enables members to have covered access to non-behavioral health inpatient services through the capitated system rather than through a FFS system. Access to inpatient services were measured by monitoring the rate of inpatient hospitalizations over the demonstration period for STAR+PLUS members in the El Paso, Hidalgo, Lubbock, and MRSA SDAs.

- **Top ten diagnoses utilized during hospitalizations.** For STAR+PLUS members who had inpatient hospital stays, another measure of inpatient hospitalization services was describing top ten diagnoses over the demonstration period for STAR+PLUS eligible members in the expansion SDAs.

- **Average number of miles from STAR+PLUS members to closest participating inpatient hospital in each new service area.** The expectation is that that members will continue to have similar or better access to inpatient services as before the expansion.

STAR - Children and Adolescent Access to Primary Care Services

Results from Table 2 indicate that at the beginning of the evaluation study period, access to primary care differed among STAR SDAs, from MRSA West SDA, averaging 63.66 percent of all children and adolescents receiving a primary care visit to the highest, Hidalgo SDA, averaging 94.52 percent of children and adolescents receiving a primary care visit. Before MMC expansion, most SDAs experienced a decreasing trend. After MMC expansion, all STAR SDAs experienced a statistically significant month-to-month increase in primary care access, except among Hidalgo SDA.

Table 2. Interrupted time series results for STAR program - Children and Adolescent Access to Primary Care

	Children and Adolescent Access to Primary Care Rate (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR Service Delivery Areas				
Hidalgo	94.52	0.55	**2.25**	-1.41
MRSA Central	65.21	-8.17	**6.05**	**2.14**
MRSA Northeast	67.68	-6.25	**8.64**	**1.84**
MRSA West	63.66	**-7.15**	**10.84**	**2.15**

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. MRSA = Medicaid Rural Service Area.

STAR+PLUS - Adult Access to Preventive/Ambulatory Health Services

Results from Table 3 indicate that at the beginning of the evaluation study period, ambulatory rates differed among STAR+PLUS SDAs, from MRSA Central SDA, averaging 412.76 ambulatory visits per month to the highest, Hidalgo SDA, averaging 845.32 ambulatory visits per month. There was no significant month-to-month change in the number of ambulatory visits, before MMC expansion (trend before MMC expansion is not statistically significant). However, immediately after MMC expansion, MRSA Central, MRSA Northeast, and MRSA West experienced sudden changes in the rates of ambulatory visits. After MMC expansion, all STAR+PLUS SDAs experienced either a statistically significant month-to-month increase in ambulatory rates (i.e., El Paso SDA, Hidalgo SDA, and MRSA Central) or no change in ambulatory rates (i.e., Lubbock, MRSA Northeast, and MRSA West).

Table 3. Interrupted time series results for STAR+PLUS program - Adult Access to Preventive/Ambulatory Health Services

	Ambulatory Rate per 1,000 member months (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR+PLUS Service Delivery Areas				
El Paso	585.55	0.13	-8.96	**5.43**
Hidalgo	845.32	-1.45	31.30	**4.41**
Lubbock	512.92	-0.58	2.64	1.40
MRSA Central	412.76	-0.96	**80.97**	**4.48**
MRSA Northeast	484.02	-0.36	**42.05**	0.26
MRSA West	438.75	0.12	**-227.00**	9.17

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. MRSA = Medicaid Rural Service Area.

Access to Inpatient Hospitalizations

STAR+PLUS - Hospitalization Rates per 1,000 Member Months

Results from Table 4 indicate that at the beginning of the evaluation study period, hospitalization rates differed among STAR+PLUS SDAs, from El Paso SDA, averaging 16 inpatient hospitalizations per 1,000 member months to the highest, MRSA Northeast SDA, averaging 22 hospitalizations per 1,000 member months. Hidalgo, Lubbock, and MRSA West SDAs experienced significant month-to-month increases in the number of hospitalizations before MMC expansion.

Table 4. Interrupted time series results for STAR+PLUS program - Hospitalization rates per 1,000 member months

	Hospitalization Rate per 1,000 member months (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR+PLUS Service Delivery Areas				
El Paso	16.45	-0.03	**2.38**	**0.11**
Hidalgo	17.67	**0.07**	-0.22	**-0.14**
Lubbock	21.38	**0.13**	0.30	**-0.31**
MRSA Central	20.40	-0.04	**3.03**	-0.02
MRSA Northeast	22.20	-0.03	-0.72	-0.01
MRSA West	18.11	**0.05**	-0.25	**-0.12**

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. MRSA = Medicaid Rural Service Area.

However, immediately after MMC expansion, El Paso and MRSA Central SDA experienced increases in hospitalizations. After MMC expansion, only El Paso SDA experienced a small increase in hospitalizations, while half of the STAR+PLUS SDAs experienced statistically significant month-to-month decreases in hospitalization rates (i.e., Hidalgo SDA, Lubbock SDA, and MRSA West), and no change in hospitalization rates for MRSA Central, and MRSA Northeast.

STAR+PLUS - Top Ten Diagnoses Utilized During Inpatient Hospitalizations

The intent of this measure was to identify the top ten most frequent inpatient hospitalization diagnoses. If the most frequent diagnoses included a high number of potentially avoidable conditions, this may indicate deficiencies in the quality of care. Results of the top ten diagnoses are reported at the SDA-level by Federal Fiscal Year (FFY) and can be found in Supplemental Materials section of Appendix B, Tables 54-59. Under the fee-for-service healthcare delivery model, the most frequent inpatient hospitalizations involved 'symptoms involving respiratory system and other chest symptoms'. This diagnosis was consistent across all SDAs for FFY 2009 - 2012. When inpatient hospitalizations were carved-in to STAR+PLUS, behavioral health (e.g., episodic mood disorders/ schizophrenic disorders) diagnoses were the most frequent causes of hospitalizations. The rate of potentially preventable hospital admissions per 1,000 member months is presented in Table 24 as a measure of healthcare quality.

STAR+PLUS – Average Miles to Closest Participating Hospital

All STAR+PLUS expansion SDAs met the 30 mile access requirement for acute care hospitals (Section 4.3.4.1 Travel Distances in Uniform Managed Care Contract).[10] On average, Hidalgo SDA post-expansion members were 0.2 miles further from an acute care hospital than pre-expansion members (5.7 vs. 5.5 average miles, respectively; $p < 0.05$) (see Figure 8). There were no statistically significant differences in average miles from acute care hospitals to member's residence for the El Paso and Lubbock SDAs. Medicaid member access did not change with the expansion of STAR+PLUS into the new SDAs.

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[10] https://www.hhsc.state.tx.us/medicaid/managed-care/forms.shtml

Figure 8. Average Distance in Miles from Acute Care Hospitals to Medicaid Members' Residence (Pre- and Post-Texas Medicaid Managed Care Expansion), STAR+PLUS Expansion Service Delivery Areas (SDAs)
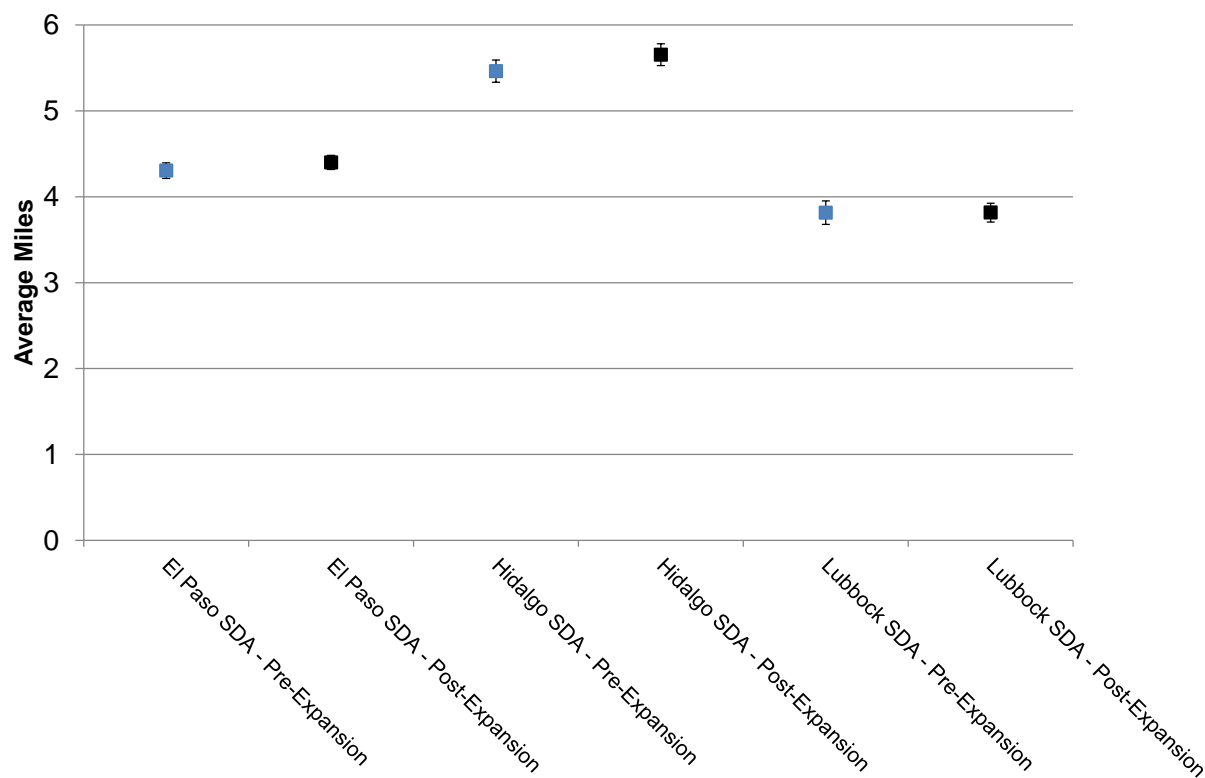
Access to Pharmacy Benefits

Three HEDIS® measures were adapted to examine the impact of the carve-in of pharmacy benefits to STAR and STAR+PLUS statewide. They are referred to as HEDIS-like measures and adaptations are specified in Table 41 in the Supplementary Materials.

- **Antidepressant Medication Management (AMM).** The AMM measure focuses on compliance with medication regimens and appropriate follow-up as the key to improved care for STAR and STAR+PLUS eligible members. The acute phase is defined as the 3 months immediately after the diagnosis of a depressive episode. The AMM acute care measure describes the percentage of eligible members who are diagnosed with a new episode of depression, treated with antidepressant medication, and remained on an antidepressant drug throughout the 3-month period. Effective continuation phase treatment is defined as the percentage of eligible members who were diagnosed with a depression, treated with antidepressant medication, and who remained on an antidepressant drug for at least 6 months.

- **Asthma Medication Ratio (AMR).** The AMR measure assesses the quality of asthma care received by STAR and STAR+PLUS eligible members who have been diagnosed with persistent/chronic asthma. Asthma medications are usually categorized into long-term controller medications used to achieve and maintain control of persistent asthma and quick-reliever medications used to treat acute symptoms and exacerbations. A ratio of controller to reliever medications of 0.50 or greater is recommended for patients with asthma. The AMR is the proportion of clients with asthma who have a medication ratio of 0.50 or greater.

Appropriate ratios of these medications could potentially prevent a significant proportion of asthma-related costs (e.g., hospitalizations, emergency room visits).

- **Adherence to Antipsychotic Medications for Individuals with Schizophrenia (SAA).** The SAA measure is used to assess the percentage of STAR and STAR+PLUS eligible members 19 to 64 years of age during the measurement year with schizophrenia who were dispensed and remained on an antipsychotic medication for at least 80 percent of their treatment period. For people with schizophrenia, nonadherence to treatment with antipsychotics is common and medication nonadherence is a significant cause of relapse. Measuring antipsychotic medication adherence may lead to less relapse and fewer hospitalizations.

STAR

For STAR clients, AMM follow-up rates demonstrated positive results: effective acute phase treatment increased, and there were also minor improvements for effective continuation phase treatment. Although, the AMM continuation ratio improved post-expansion, the minimal increase in the continuation phase treatment suggests improvement is needed in client adherence to antidepressant drugs for people with chronic depression (Table 5). Asthma medication ratio (AMR) also improved post-expansion of MMC for all age groups, especially STAR children aged 5 to 11 years and 12 to 18 years. Adherence to antipsychotic medications for individuals with schizophrenia and/or bipolar disorder (SAA) experienced a modest improvement post-expansion.

Table 5. Descriptive trend results for STAR program - access to pharmacy carve-in benefits (HEDIS®-like measures)

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
Medication Measures			
Antidepressant Medication Management (AMM)	(N = 4,940)	(N = 10,763)	
HEDIS® Ratio - Acute	14.53	16.95	2.41
HEDIS® Ratio - Continuation	3.00	3.35	0.36
Asthma Medication Ratio (AMR)	(N = 18,912)	(N = 26,208)	
HEDIS® Ratio - All age groups	8.57	48.38	39.82
HEDIS® Ratio - 5 - 11 years	11.58	57.25	45.67
HEDIS® Ratio - 12 - 18 years	4.50	17.77	13.27
HEDIS® Ratio - 19 - 50 years	1.58	22.51	20.94
HEDIS® Ratio - 51 - 64 years	0.00	33.33	33.33
Adherence to Antipsychotic Medications for Individuals with Schizophrenia (SAA)	(N = 1,469)	(N = 3,672)	
HEDIS® Ratio	8.10	8.71	0.61

HEDIS® stands for Health Employer Data and Information Set and includes a variety of propriety healthcare measures

STAR+PLUS

For STAR+PLUS clients, AMM follow-up rates improved for acute and continuation phase treatments from the post-expansion carve-in of pharmacy benefits. Although, the AMM ratios improved post-expansion, the results suggest improvement is needed in client adherence to

antidepressant drugs (Table 6). Asthma medication ratio (AMR) improved post-expansion for all STAR+PLUS age groups. Adherence to antipsychotic medications for individuals with schizophrenia (SAA) experienced a modest improvement post-expansion of MMC.

Table 6. Descriptive trend results for STAR+PLUS program - access to pharmacy carve-in benefits (HEDIS®-like measures)

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
Medication Measures			
Antidepressant Medication Management (AMM)	(N =16,224)	(N = 18,665)	
HEDIS® Ratio - Acute	17.39	20.12	2.73
HEDIS® Ratio - Continuation	6.39	7.45	1.06
Asthma Medication Ratio (AMR)	(N = 10,823)	(N = 14,810)	
HEDIS® Ratio - All age groups	10.21	25.44	15.23
HEDIS® Ratio - 19 - 50 years	6.92	27.55	20.62
HEDIS® Ratio - 51 - 64 years	12.62	24.11	11.49
Adherence to Antipsychotic Medications for Individuals with Schizophrenia (SAA)	(N = 46,123)	(N = 57,579)	
HEDIS® Ratio	4.86	7.43	2.57
HEDIS® stands for Health Employer Data and Information Set and includes a variety of propriety healthcare measures.			
STAR+PLUS enrollment includes individuals 21 years and older. AMR age groups 5-11 and 12-18 were not included.			

Access and Utilization of Dental Benefits

Three measures of access and one quality measure included in the final evaluation report examined whether Demonstration activities impacted children's access to dental providers and quality of care. For dental analysis, State Fiscal Year (SFY) (September 1 - August 31) was used instead of FFY due to logistical issues. Since there is only a one month difference between SFY and FFY, this did not dramatically alter the results of the dental analysis.

- **Participating children's access to dental services.** As children's dental care benefits were delivered through capitated statewide dental services (Children's Medicaid Dental services), access to dental care for plan members was measured and monitored over the demonstration period. Access to dental services was measured annually through:
  - Percent of children who received at least one diagnostic dental service
  - Percent of children who received at least two dental check-ups
  - Percent of children who received at least one fluoride treatment
- Dental quality was measured as the number of children who received restorative dental services per 1,000 members.

Overall, almost 60 percent of Texas Medicaid children (age 0 to 20 years) had a dental visit in the past SFY (from 2010–2014), exceeding the HP2020 target of 49 percent (see Figure 9). However, analysis by age cohort showed a slight decrease in utilization since SFY2013, especially for Medicaid children 10 years and older. Clients aged less than one year had the lowest utilization rates of any age cohort. However, they experienced a steady increase in utilization every year from SFY2010 through SFY2014.

Stratification by demographic group can be found in Tables 7 to 14. It is important to note there are missing demographic data in each age group, therefore it is not always prudent to compare the overall combined data (Figures 9 and 10) with each demographic table (7 to 14) to draw conclusions. Rather, each demographic table should be used to evaluate any disparities between demographic groups, and to evaluate how groups changed over time. In contrast, the figures should be used to visualize dental utilization across all groups over time, and should be utilized to compare age groups to each other.

In addition to analyzing a single dental visit in a year at different levels, the evaluators calculated the following dental measures: percentage of Medicaid Dental children who had at least two dental visits in a year (Table 15), and percentage of Medicaid Dental children who had at least one topical fluoride application in a year (Table 16). The overall proportion of children with at least two dental visits is well below the proportion with at least one dental visit over the evaluation period. The proportion of children getting a fluoride treatment remained approximately 44 percent throughout the evaluation period, with the highest percentage (44.8 percent) in the last evaluation year (SFY2014).

Figure 9. Proportion of Texas Medicaid Children Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014
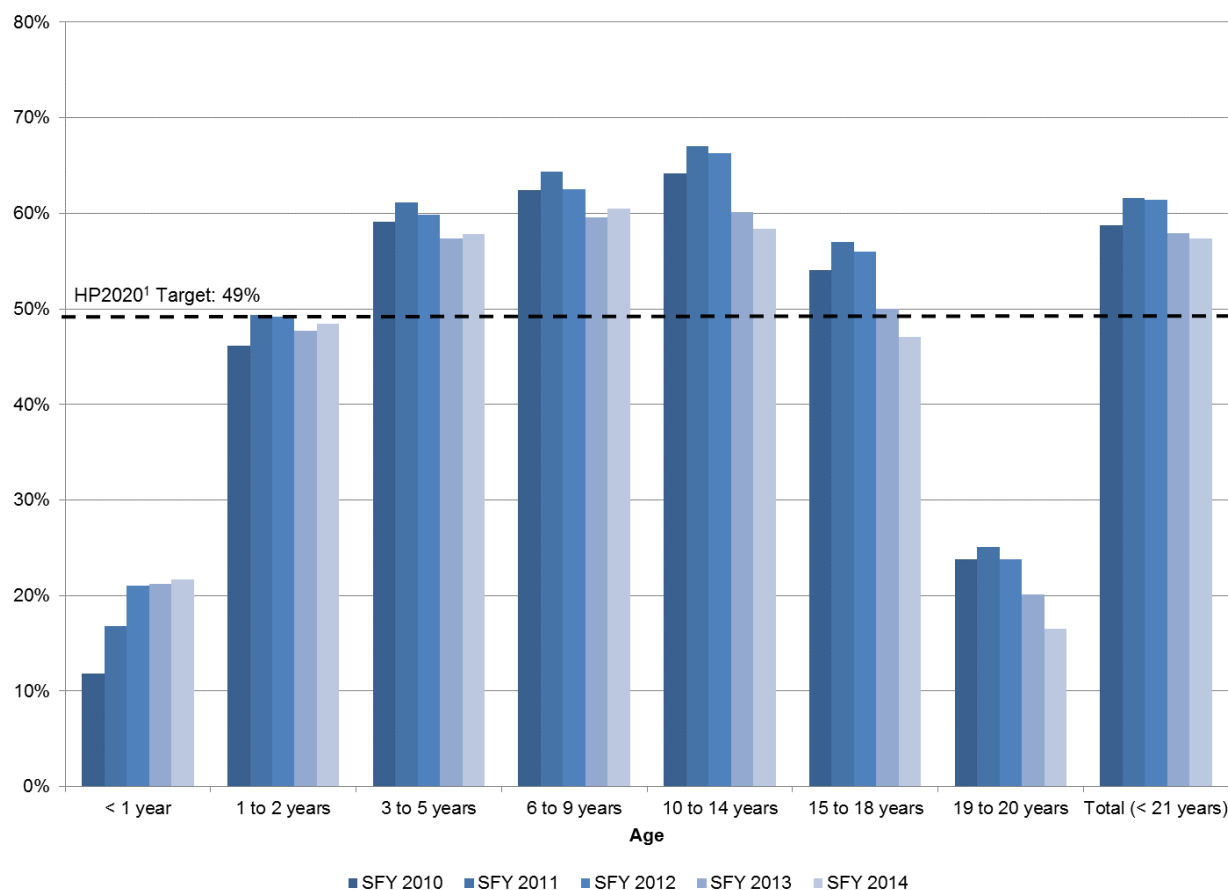
[1] Healthy People 2020 (HP2020).
Number of eligible children 2010: 3,360,497; 2011: 3,570,945; 2012: 3,631,772; 2013: 3,601,554; 2014: 3,752,276

In an effort to encourage more efficient and appropriate utilization of dental services, the majority of Medicaid children receiving dental services through a FFS delivery model were shifted into a MMC service delivery model. Prior to the Demonstration, the dental MMC population was predominantly comprised of STAR Health clients (foster children) while other Medicaid children were provided dental services though an FFS model. Medicaid clients who are over age 20, reside in a Medicaid-paid facility (e.g., nursing home, state supported living center, etc.), or are enrolled in STAR Health, are not eligible to participate in the Children's Medicaid Dental MMC program and continue to receive dental services through their existing service delivery models. The dental benefits package remained the same as members shifted from FFS to MMC.

Figure 10 shows that all services declined from SFY2011 to SFY2012, except MMC orthodontics. Preventive and diagnostic services remained the most utilized even through the transition period. Compared to the MMC service delivery model, FFS experienced greater declines in SFY2013, before rebounding in SFY2014. For example, FFS diagnostic services declined almost 5 percent from SFY2011 to SFY2012 before declining almost another 10

percent from SFY2012 to SFY2013. In SFY2014, FFS diagnostic services increased to almost pre-Demonstration utilization rates.

A similar trend was observed for FFS preventive services. In SFY2011, 79 percent of children received at least one preventive visit. In SFY2013, this decreased to 65 percent, but then increased to almost pre-Demonstration utilization rates in SFY2014.

The MMC service delivery model provided more diagnostic services compared to FFS over the study period (SFY2010 to SFY2014). Utilization of preventive services was similar for FFS and MMC until SFY2013, when MMC surpassed pre-Demonstration rates.

Figure 10. Proportion of Texas Medicaid Children (Total < 21 years) Who Had at Least One Dental Visit by Service Category, State Fiscal Year (SFY) 2010–2014
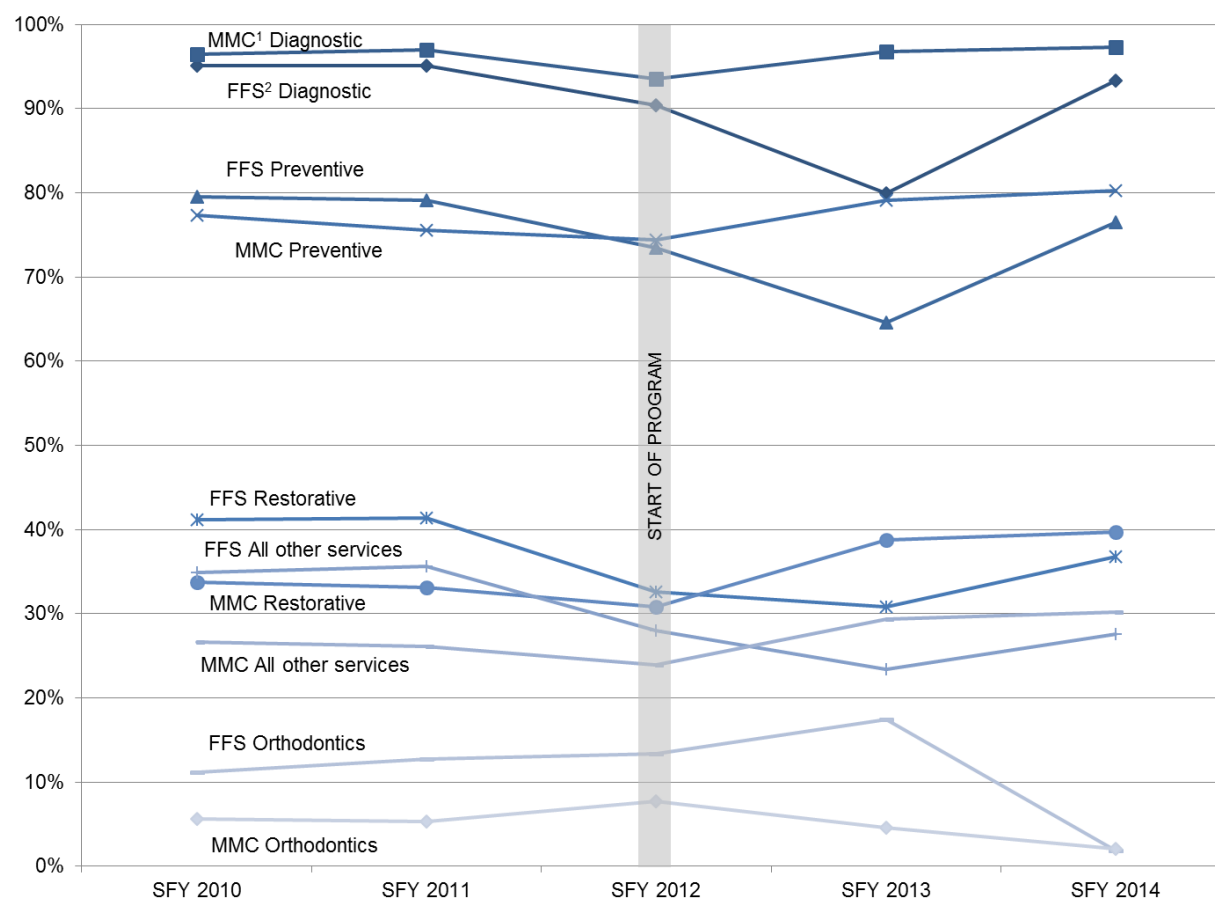
¹ Medicaid Managed Care (MMC)
² Fee-for-Service (FFS)
Number of eligible children 2010: 3,360,497; 2011: 3,570,945; 2012: 3,631,772; 2013: 3,601,554; 2014: 3,752,276

Demographic tables (Tables 7 - 14) stratify characteristics of children who had at least one dental visit in the past year, for each state fiscal year both pre- and post-Demonstration. Some consistent trends were seen in all age groups throughout the evaluation study period. There was no noteworthy difference in dental utilization between males and females. Females had slightly higher utilization for nearly all age groups after age one. Males had a slightly higher

proportion utilizing a dental service in the 19 to 20 year old age group and the overall less than 21 group. However, while the reason is unknown, in the 19 to 20 year old age group, males had a drastically lower number of eligible clients than females, which explains why the raw numbers of clients receiving a service are much lower, but the proportions between males and females are comparable (Table 14). African-American clients consistently had a higher rate of dental utilization than their Hispanic and White counterparts through the study period, and White clients had the lowest utilization throughout.

Among Medicaid-enrolled clients under age 21, there were differences in dental utilization by race (Table 7). Dental utilization among African-Americans exceeded that of Whites by at least 17 percentage points every year, and exceeded that of Hispanics by at least eight percentage points every year. This trend is seen in all age groups. As of SFY2012, the only racial/ethnic group that had not achieved the 49 percent HP2020 target was Other. A decrease in dental utilization for clients under age 21 was seen for all racial/ethnic groups in SFY2013 and again in SFY2014. These decreases caused Whites to fall below the threshold of 49 percent. The racial/ethnic group Other remained below 49 percent, while Hispanics and African-Americans maintained the HP2020 target throughout the evaluation study period.

This descriptive analysis cannot answer questions regarding differences by demographic characteristics, but the dental benefits offered in the shift from FFS to MMC remained the same.

Table 7. Proportion of Texas Medicaid Children <21 Years of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	970,276	58.6	1,081,372	61.3	1,082,980	60.3	1,027,441	57.5	1,073,021	57.4
Female	983,774	57.7	1,094,811	60.6	1,094,108	59.7	1,031,731	56.9	1,070,238	56.9
Race/Ethnicity										
White	291,064	46.4	319,447	50.1	299,723	49.7	268,681	47.1	273,529	46.5
Hispanic	286,772	53.2	317,298	57.9	311,920	58.5	274,792	53.2	277,974	52.5
African-American	1,301,197	64.4	1,424,946	67.5	1,370,207	66.8	1,282,787	64.2	1,341,226	63.7
Other	75,045	43.2	114,603	50.1	195,511	44.1	233,222	45.2	250,812	47.3

Infants less than one year old experienced steady increases in utilization throughout the evaluation (Table 8). African-American infants had the highest utilization in all years, and reached the highest levels in five years at 27.2 percent in SFY2014. None of the reported infant demographic groups reached the HP2020 goal of 49 percent.

Table 8. Proportion of Texas Medicaid Children <1 Year of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	29,063	12.0	42,519	17.0	52,994	21.3	53,012	21.5	55,241	22.1
Female	26,994	11.6	39,555	16.5	49,445	20.7	49,143	20.9	50,783	21.3
Race										
White	6,694	7.2	9,684	12.0	8,873	15.5	8,100	15.8	9,907	17.0
Hispanic	5,162	8.5	7,387	14.1	7,430	19.8	5,193	15.8	7,709	18.8
African-American	38,442	14.9	53,208	21.8	52,760	26.4	46,605	25.5	55,711	27.2
Other	5,760	9.4	11,818	10.5	33,435	17.2	42,308	19.7	32,724	17.7

Demographic information for children aged 1 to 2 is seen in Table 9. Starting at age 1 to 2 through the 15 to 18 year old age group, females used dental services at a slightly higher rate than males (a maximum of 2.8 percentage points higher in this age group). Hispanic and White rates of utilization still remained much lower than those of African-Americans, with Whites having the lowest rate for SFY2014 at 37.7 percent. This rate among Whites did, however, increase every year since the initiation of the evaluation. In the 1 to 2 year old age group, African-Americans were the only racial group to have met and exceeded the HP2020 target, and had done so each year of the evaluation study period.

Table 9. Proportion of Texas Medicaid Children 1 to 2 Years of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	163,357	46.0	175,914	49.3	164,438	47.2	151,872	45.6	153,023	46.3
Female	156,305	46.1	168,375	49.3	170,546	50.8	159,120	49.9	160,210	50.7
Race										
White	41,626	32.1	45,838	35.5	42,204	36.6	35,114	36.7	34,344	37.7
Hispanic	37,263	38.4	40,720	42.8	38,957	45.1	29,971	42.2	27,614	41.9
African-American	224,561	52.7	230,036	55.9	208,959	55.6	175,702	54.4	166,242	54.9
Other	16,219	39.0	27,718	44.1	44,958	42.2	70,315	43.3	85,122	45.6

In Tables 10 through 12, many of the aforementioned demographic trends remained consistent in other age groups, with Whites having the lowest rates of dental utilization that fall below HP2020 target levels beginning in the post-Demonstration period. Females still had a consistent and slightly higher rate of utilization throughout the evaluation study period.

Table 10. Proportion of Texas Medicaid Children 3 to 5 Years of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	239,605	58.7	263,107	60.7	260,607	59.2	245,153	56.9	242,307	57.5
Female	230,226	59.3	252,770	61.4	252,046	59.9	237,712	57.7	235,399	58.2
Race										
White	65,906	46.8	73,359	49.1	70,030	47.3	63,874	45.1	62,422	45.9
Hispanic	62,606	52.9	70,440	56.2	71,311	56.2	64,246	52.0	62,480	52.9
African-American	328,301	64.1	353,581	66.0	340,798	64.3	317,511	62.4	307,068	63.5
Other	13,023	51.8	18,517	52.7	30,564	54.4	37,280	53.7	45,803	52.0

Table 11. Proportion of Texas Medicaid Children 6 to 9 Years of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	251,798	61.7	279,060	63.6	279,311	61.5	270,178	58.9	291,083	59.9
Female	244,588	62.9	271,856	65.1	271,527	62.9	261,938	60.1	281,456	61.0
Race										
White	72,200	52.7	78,496	54.2	74,847	51.7	69,373	48.6	73,591	49.1
Hispanic	70,692	56.0	77,982	59.5	78,141	58.2	73,042	53.7	77,298	54.4
African-American	337,172	66.8	370,896	68.6	361,169	66.2	352,259	64.1	381,417	65.3
Other	16,328	57.5	23,564	58.7	36,721	60.1	37,492	57.0	40,283	56.7

Table 12. Proportion of Texas Medicaid Children 10 to 14 Years of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	231,292	61.6	264,130	64.0	266,869	61.8	252,060	57.6	271,891	57.0
Female	231,591	64.8	266,594	67.8	268,475	65.3	251,972	60.5	269,321	59.3
Race										
White	71,175	54.2	79,027	56.4	74,570	53.4	66,856	48.9	69,227	47.4
Hispanic	75,078	57.8	84,162	62.0	82,868	59.9	72,691	52.8	74,153	51.5
African-American	299,516	67.8	342,234	70.4	336,545	67.8	322,361	64.0	353,212	63.1
Other	17,117	57.7	25,315	58.1	41,406	60.0	42,169	55.6	44,757	54.5

Every demographic group experienced a decline in utilization in the 15 to 18 year old age group compared with younger age groups (Figure 9, Table 13). In this age group, each demographic

group began to fall below the 49 percent HP2020 threshold in the post-Demonstration period, or at least came very close to it. The differences between racial/ethnic groups maintained consistent patterns even though dental rates of utilization decreased.

Table 13. Proportion of Texas Medicaid Children 15 to 18 Years of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	119,579	51.6	137,280	54.0	135,209	51.3	123,706	46.7	131,482	45.0
Female	140,274	52.9	158,724	56.0	155,291	53.7	140,115	49.1	146,873	47.7
Race										
White	43,752	45.4	47,770	47.5	43,625	44.7	37,878	40.4	38,417	38.4
Hispanic	47,001	48.4	51,597	51.6	49,230	49.3	41,868	42.8	42,327	41.4
African-American	159,099	56.4	182,183	59.3	175,629	56.7	161,684	52.4	173,385	50.8
Other	10,008	47.2	14,467	48.2	22,032	48.5	22,414	44.4	24,249	42.9

In 19 to 20 year old clients, there was a large reduction in utilization of dental services compared with younger age groups (Figure 9, Table 14). Dental utilization was only marginally higher in these young adult clients than in the infants. As noted previously, the number of 19 to 20 year old males eligible to receive dental benefits decreased, and therefore the numbers of males accessing dental services also decreased, but utilization rates were still similar to females. The 19 to 20 year old cohort is also the only age group in which African-Americans didn't have the highest rates of dental utilization; in the Other racial/ethnic group, over one in five clients received at least one dental service in SFY2014. This was, however, still the lowest rate for clients of Other race/ethnicity seen in the five year evaluation study period. While the reason for reduction in utilization among this age group cannot be explained by this descriptive analysis, there were dental benefits package remained the same in the shift from FFS to MMC.

Table 14. Proportion of Texas Medicaid Children 19 to 20 Years of Age Who Had at Least One Dental Visit in the Past Year, State Fiscal Year (SFY) 2010–2014

| | Pre-Demonstration | | | | | | Post-Demonstration | | | |
| | SFY 2010 | | SFY 2011 | | SFY 2012 | | SFY 2013 | | SFY 2014 | |
Characteristic	Count	%	Count	%	Count	%	Count	%	Count	%
Gender										
Male	7,532	21.5	9,241	22.9	8,584	20.3	7,084	16.7	6,864	15.2
Female	27,601	21.2	29,761	21.8	26,461	19.5	21,676	16.9	18,626	15.1
Race										
White	8,084	19.9	8,165	20.1	6,629	17.6	5,216	15.6	4,257	13.6
Hispanic	7,068	21.2	7,552	21.6	6,666	19.2	4,996	15.4	4,119	13.3
African-American	17,713	21.5	20,122	22.8	17,079	19.4	13,771	16.2	12,276	14.4
Other	2,268	24.8	3,163	24.7	4,673	26.4	4,777	24.5	4,839	22.9

Among all Medicaid Dental eligible children (age 20 years and younger), those who saw a dentist twice a year declined since a high of 38.8 percent in SFY2011 (Table 15). This decline over time becomes especially apparent in the post-Demonstration period, with a 3.2 percentage point drop between SFY2012 and SFY2013, and ultimately a drop to 33.4 percent in SFY2014.

Table 15. Proportion of Texas Medicaid Children <21 Years of Age Who Had at Least Two Dental Visits in the Past Year, State Fiscal Year (SFY) 2010–2014

Pre-Demonstration						Post-Demonstration			
SFY 2010		SFY 2011		SFY 2012		SFY 2013		SFY 2014	
Count	%	Count	%	Count	%	Count	%	Count	%
1,195,357	35.6	1,384,777	38.8	1,345,512	37.0	1,215,918	33.8	1,254,382	33.4

Number of eligible children 2010: 3,360,497; 2011: 3,570,945; 2012: 3,631,772; 2013: 3,601,554; 2014: 3,752,276

Among all Medicaid Dental eligible children (age 20 years and younger), the proportion of children who had at least one topical fluoride application in the past year remained fairly constant, with the highest rate (44.8 percent) seen in SFY2014 (Table 16). There was a decline of 1.3 percentage points in the post-Demonstration period, from SFY2012 to SFY2013, but this was recovered in a 1.5 percentage point increase from SFY2013 to SFY2014.

Table 16. Proportion of Texas Medicaid Children <21 Years of Age Who Had at Least One Topical Fluoride Application in the Past Year, State Fiscal Year (SFY) 2010–2014

Pre-Demonstration						Post-Demonstration			
SFY 2010		SFY 2011		SFY 2012		SFY 2013		SFY 2014	
Count	%	Count	%	Count	%	Count	%	Count	%
1,427,268	42.5	1,596,138	44.7	1,618,592	44.6	1,557,745	43.3	1,682,709	44.8

Number of eligible children 2010: 3,360,497; 2011: 3,570,945; 2012: 3,631,772; 2013: 3,601,554; 2014: 3,752,276

EVALUATION GOAL 2: CARE COORDINATION

Four measures were utilized to examine whether the expansion of MMC impacted care coordination for the target population.

- **Client perception of how informed providers are about care.** As MMC expanded for adults and children, surveys were conducted among the STAR and STAR+PLUS populations at regular intervals by an external quality review organization on behalf of Texas HHSC. Consumer Assessment of Healthcare Providers and Systems (CAHPS®) is one such survey administered to children and adults. As MMC expanded throughout the state clients in new MMC SDAs were included in the statewide survey sample. As MMC expanded, it was expected that the percent of members "who felt their personal doctor always or usually seemed informed and up-to-date about the care they got from these [other] doctors or health providers" would increase.

- **Adult access to preventive/ambulatory health services.** As MMC expanded through the STAR+PLUS delivery system, the number of preventive or ambulatory care visits by MCO members was measured and categorized as a new patient, existing patient, home patient, or other patient. As members formerly receiving benefits under FFS or PCCM moved into

STAR+PLUS, it was expected that the percent of members who were categorized as existing patients would increase.

- **Mental Health Rehabilitative Services**. Rehabilitative services were carved into MMC statewide. The service expansion provides a natural experiment to compare the state to the carve-out of services in the North STAR program in Dallas SDA.

- **Mental Health Targeted Case management**. Case management reflects care coordination's concepts of collaboration amongst diverse stakeholders to meet an individual's health needs (McDonald, et al., 2010). Like rehabilitative services, the statewide carve-in of behavioral health target case management into STAR and STAR+PLUS provided a natural experiment to compare the state to the carve-out of services in the North STAR program in Dallas SDA.

STAR - Child Client Perception of how Informed Providers are about Care

Table 17 shows that prior to implementation of the Demonstration, the STAR child population felt their personal doctor was usually or always informed and up-to-date about the care they received from other doctors 70.1% of the time, based on a survey in SFY 2011. In contract years 2013 and 2015 as new MMC clients in expansion SDAs were included in the survey, 75.2% and 76.2%, respectively, of STAR child respondents reported the same thing overall. In contract year 2015, the survey was stratified by the MRSAs and results varied as 90.2%, 79.4%, and 70.1% of STAR child respondents in the MRSA Central, MRSA Northeast, and MRSA West SDAs, respectively, reporting feeling their child's personal doctor was informed about his or her care.

Table 17. STAR Child client perception of how informed providers are about care

	SFY 2009	SFY 2011	CY 2013	CY 2015	
CAHPS® Survey Question					
Percent of clients who felt their personal doctor *always* or *usually* seemed informed and up-to-date about the care they got from these [other] doctors or other health providers.	n/a	70.1%	75.2%	Overall	76.2%
				MRSA Central	90.2%
				MRSA Northeast	79.4%
				MRSA West	70.1%
CAHPS® = Consumer Assessment Of Healthcare Providers and Systems. SFY = State fiscal year. CY = Contract year. MRSA = Medicaid Rural Service Area.					

STAR - Adult Client Perception of how Informed Providers are about Care

Table 18 shows that prior to implementation of the Demonstration, the STAR adult population felt their personal doctor was usually or always informed and up-to-date about the care they received from other doctors 63.3% of the time, based on a survey in SFY 2009. As new MMC clients in expansion SDAs were included in the survey, in contract years 2012, 2014, and 2016; 61.0%, 71.4%, and 73.6%, respectively, of STAR adult respondents reported the same thing overall. In contract years (CY) 2014 and 2016, the survey was stratified by the MRSAs but results were fairly consistent. In CY 2014, 76.3%, 77.5%, and 75.3% of respondents felt their personal doctor was in formed in the MRSA Central, MRSA Northeast, and MRSA West SDAs, respectively. The proportions increased slightly in CY 2016 as 82.8%, 78.6%, and 82.9% of respondents felt their doctors were informed in the MRSA Central, MRSA Northeast, and MRSA West SDAs, respectively.

Table 18. STAR Adult client perception of how informed providers are about care

	SFY 2009	CY 2012	CY 2014		CY 2016	
CAHPS® Survey Question						
Percent of clients who felt their personal doctor *always* or *usually* seemed informed and up-to-date about the care they got from these [other] doctors or other health providers.	63.3%	61.0%	Overall	71.4%	Overall	73.6%
			MRSA Central	76.3%	MRSA Central	82.8%
			MRSA Northeast	77.5%	MRSA Northeast	78.6%
			MRSA West	75.3%	MRSA West	82.9%
CAHPS® = Consumer Assessment Of Healthcare Providers and Systems. SFY = State fiscal year. CY = Contract year. MRSA = Medicaid Rural Service Area.						

STAR+PLUS - Adult Client Perception of how Informed Providers are about Care

Table 19 shows that prior to implementation of the Demonstration, the STAR+PLUS population felt their personal doctor was usually or always informed and up-to-date about the care they received from other doctors 72.9%, 77.0%, and 75.0% of the time, based on surveys in SFY 2009 - 2011. As new MMC clients in expansion SDAs were included in the survey, in SFY 2012, CY 2014, and CY 2016: 67.5%, 71.9%, and 75.5%, respectively, of STAR+PLUS respondents reported the same thing overall. In CY 2016, the survey was stratified by the MRSAs and 79.1%, 82.3%, and 80.8% of respondents in the MRSA Central, MRSA Northeast, and MRSA West, respectively, felt their personal doctor was informed.

Table 19. STAR+PLUS client perception of how informed providers are about care

	SFY 2009	SFY 2010	SFY 2011	SFY 2012	CY 2014	CY 2016	
CAHPS® Survey Question							
Percent of clients who felt their personal doctor *always* or *usually* seemed informed and up-to-date about the care they got from these [other] doctors or other health providers.	72.9%	77.0%	75.0%	67.5%	71.9%	Overall	75.5%
						MRSA Central	79.1%
						MRSA Northeast	82.3%
						MRSA West	80.8%
CAHPS® = Consumer Assessment Of Healthcare Providers and Systems. SFY = State fiscal year. CY = Contract year. MRSA = Medicaid Rural Service Area.							

STAR+PLUS - Rate of Ambulatory Visits for Clients Categorized as an Existing Patient

Interrupted time series analysis indicates that before MMC expansion, there was no significant month-to-month change in the rate of ambulatory visits for existing STAR+PLUS patients (trends by SDA before MMC expansion were not statistically significant). After MMC expansion, all STAR+PLUS SDAs experienced a month-to-month increase in ambulatory rates, including a sudden change in the rate of ambulatory visits for existing clients in MRSA Central, MRSA Northeast, and MRSA West SDAs. However, only El Paso and Hidalgo SDAs increased trends were statistically significant (Table 20).

Table 20. Interrupted time series results for ambulatory rates for STAR+PLUS clients categorized as existing patient

	Ambulatory Rate for Existing Clients per 1,000 member months (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR+PLUS Service Delivery Areas				
El Paso	503.08	0.48	-11.17	**4.57**
Hidalgo	744.53	-0.81	19.05	**3.20**
Lubbock	369.58	-0.04	17.98	0.97
MRSA Central	233.53	1.34	**89.21**	2.52
MRSA Northeast	373.81	0.08	**39.34**	0.39
MRSA West	358.50	0.42	**-207.14**	7.97
Note: Values in bold indicate statistical signifance at $P < 0.05$ level. MRSA = Medicaid Rural Service Area.				

STAR - Mental Health Rehabilitative Services and Targeted Case Management

Mental health utilization described in Table 21 compares utilization of rehabilitative services and targeted case management pre- and post-expansion between NorthSTAR (comparison) and the rest of the state of Texas (case). There was no relationship between MMC expansion and rehabilitative services, and the difference-in-difference estimation is non-significant. In contrast, there was a small but significant increase in utilization of targeted case management benefits in STAR, as compared to the NorthSTAR program. (The adjusted estimator demonstrates a small, but statistically significant effect size.)

Table 21. Difference-in-difference analysis of change in the percent use of Mental Health Rehabilitative Services and Targeted Case Management in Texas (case) and NorthSTAR (comparison) for STAR members

STAR	STAR Statewide (Case)			NorthSTAR (Comparison)			Between-Group Difference		
	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Unadjusted	Adjusted	(95% Confidence Interval)
	(N = 51,945)	(N = 41,202)		(N = 3,989)	(N = 2,283)				
Mental Health Rehabilitative Services	0.76	0.77	0.01	0.23	0.19	-0.04	0.05	0.01	(-0.003 - 0.02)
Mental Health Targeted Case Management	0.45	0.48	0.02	0.12	0.08	-0.03	0.06	**0.02**	**(0.01 - 0.03)**

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. Adjusted models include sex, age, and race.

STAR+PLUS - Mental Health Rehabilitative Services and Targeted Case Management

Table 22 describes the relationship between utilization of rehabilitative services and targeted case management pre- and post-expansion compared between NorthSTAR (comparison) and the rest of the state of Texas (case). There was a significant and positive association with both rehabilitative services and carving in targeted case management benefits into STAR+PLUS, as compared to the NorthSTAR program. The adjusted estimators demonstrate small, but statistically significant effect sizes, indicating more use of rehabilitative services and targeted case management among STAR+PLUS as compared to NorthSTAR members.

Table 22. Difference-in-difference analysis of change in the percent use of Mental Health Rehabilitative Services and Targeted Case Management in case (Texas) and comparison (NorthSTAR) for STAR+PLUS members

STAR+PLUS	STAR+PLUS Statewide (Case)			NorthSTAR (Comparison)			Between-Group Difference		
	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Unadjusted	Adjusted	(95% Confidence Interval)
	(N = 104,167)	(N = 61,805)		(N = 3,989)	(N = 2,283)				
Mental Health Rehabilitative Services	3.21	1.48	-1.73	0.25	0.18	-0.07	-1.66	**0.02**	**(0.01 - 0.02)**
Mental Health Targeted Case Management	0.89	0.47	-0.42	0.11	0.08	-0.03	-0.39	**0.02**	**(0.02 - 0.02)**

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. Adjusted models include sex, age, and race.

EVALUATION GOAL 3: QUALITY OF CARE

Eight quality of care measures were monitored over the demonstration period for STAR members in the Hidalgo SDA; and the Central, Northeast, and West MRSAs; and STAR+PLUS members in Lubbock, Hidalgo, and El Paso SDAs; and the Central, Northeast, and West MRSAs. For these indicators, improvements in process measures should result in a decreasing trend in intermediate health outcomes over the demonstration period (see Figure 5).

The ambulatory care sensitive conditions (ACSC) specifications used to calculate three of these measures are adapted from AHRQ's Prevention Quality Indicators (PQIs) version 5.0 which measure potentially avoidable hospitalizations for ACSCs. Diagnoses were coded using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). Additional ACSC measures were added to the list of AHRQ PQIs in order to maintain consistency with other Texas HHSC healthcare quality reports. A detailed list of conditions and related ICD-9-CM codes can be found in Table 53.

Rates of ACSC were calculated by dividing the number of potentially preventable ED or hospital episodes by the number of member months in the SDA. For most conditions, rates are calculated out of 1,000 member months. Results are reported by federal fiscal year (FFY) and SDA. Unlike most other measures provided in this report, low rates for PQIs are desired as they suggest a better quality healthcare system outside the hospital setting.

- **Number of potentially preventable hospital admissions per 1,000 member months.** It is expected that members who receive regular preventative services through their primary care physician will show a decrease in potentially preventable hospitalizations in new managed care SDAs.
- **Number of potentially preventable emergency department visits per 1,000 member months.** It is expected that members who receive regular preventative services through their primary care physician will show a decrease in potentially preventable ED visits in new managed care SDAs.
- **Number of potentially preventable hospital readmissions per 1,000 member months.** It is expected that members who receive regular preventative services through their primary care physician will show a decrease in potentially preventable hospital readmissions in new managed care SDAs.

Other measures used to determine any changes in quality of care through implementation of the Demonstration include:

- **Number of hospitalizations from asthma per 1,000 members.** It is expected that members who have access to pharmacy benefits will experience a decrease in hospitalizations from asthma in new managed care SDAs.

- **Number of hospitalization from SPMI per 1,000 members.** It is expected that members who have access to pharmacy benefits will experience a decrease in hospitalizations from severe and persistent mental illness in new managed care SDAs.

- **Likelihood of hospital event for clients qualified to receive mental health targeted case management.** Case management reflects care coordination's concepts of

collaboration amongst diverse stakeholders to meet an individual's health needs (McDonald, et al., 2010). Like rehabilitative services, the statewide carve-in of behavioral health target case management into STAR and STAR+PLUS provided a natural experiment to compare the state to the carve-out of services in the North STAR program in Dallas SDA.

- **Percent of clients who rated their health plans as 9 or 10 on a scale of 0 (worst) to 10 (best).** As MMC expanded for adults and children, surveys are conducted among the STAR and STAR+PLUS populations at regular intervals by an external quality review organization on behalf of Texas Health and Human Services Commission. Consumer Assessment of Healthcare Providers and Systems (CAHPS®) is one such survey administered to children and adults. As MMC expanded throughout the state, it was expected that the percent of members who rated their health plan as 9 or 10 on a scale of 0 (worst) to 10 (best) would increase.

- **Nursing facility quality of care.** On March 1, 2015, Texas HHSC began delivering nursing facility benefits for most adults ages 21 and older through the STAR+PLUS healthcare delivery model. Quality of care was operationalized as the rate of inpatient hospitalizations per 1,000 nursing facility clients.

Potentially Preventable Hospital Admissions

STAR

Results from Table 23 indicate that at the beginning of the evaluation study period, potentially preventable hospitalization rates were lower among the STAR program SDAs than the STAR+PLUS program SDAs. Immediately before MMC expansion all STAR program SDAs experienced a statistically significant decrease in potentially preventable hospital admissions. All STAR SDAs show month-to-month increases after MMC expansion, however none of the trends were statistically significant.

Table 23. Interrupted time series results for STAR - Potentially Preventable Hospitalizations per 1,000 member months

	Potentially Preventable Hospitalization Rate per 1,000 member months (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR Service Delivery Areas				
Hidalgo	1.80	**-0.02**	-0.05	0.01
MRSA Central	1.37	**-0.02**	0.14	0.01
MRSA Northeast	1.41	**-0.02**	0.08	0.01
MRSA West	1.58	**-0.02**	0.05	0.01

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. MRSA = Medicaid Rural Service Area.

STAR+PLUS

Results from Table 24 indicate that at the beginning of the evaluation study period, potentially preventable hospitalization rates differed among STAR+PLUS SDAs, from Hidalgo SDA, averaging six potentially preventable hospitalizations per month to the highest, MRSA Northeast SDA, averaging almost nine potentially preventable hospitalizations per month. After MMC expansion, most STAR+PLUS SDAs experienced a month-to-month decrease in potentially preventable hospitalization rates, except for MRSA Northeast SDA, which showed an increasing trend.

Table 24. Interrupted time series results for STAR+PLUS - Potentially Preventable Hospitalizations per 1,000 member months

	Potentially Preventable Hospitalization Rate per 1,000 member months (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR+PLUS Service Delivery Areas				
El Paso	6.16	-0.02	0.48	-0.02
Hidalgo	6.13	0.01	**-0.91**	**-0.04**
Lubbock	8.63	0.00	0.59	**-0.09**
MRSA Central	8.53	**-0.05**	0.60	-0.02
MRSA Northeast	8.78	**-0.05**	**-1.00**	**0.06**
MRSA West	7.63	0.00	-0.36	-0.05

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. MRSA = Medicaid Rural Service Area.

Preventable Emergency Department Visits

STAR

Results from Table 25 indicate that at the beginning of the evaluation study period, potentially preventable emergency room visits were lower among the STAR program SDAs than the STAR+PLUS program SDAs. Immediately after MMC expansion all STAR program SDAs experienced a statistically significant increase in potentially preventable emergency room visits. All STAR SDAs show month-to-month increases after MMC expansion, however none of the trends was statistically significant.

Table 25. Interrupted time series results for STAR - Potentially Preventable Emergency Room visits per 1,000 member months

	Potentially Preventable Emergency Room Rate per 1,000 member months (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR Service Delivery Areas				
Hidalgo	3.46	-0.01	**4.82**	0.07
MRSA Central	16.67	-0.11	**14.44**	0.07
MRSA Northeast	20.48	-0.20	**21.73**	0.07
MRSA West	13.75	-0.05	**13.94**	0.04
Note: Values in bold indicate statistical signifance at $P < 0.05$ level. MRSA = Medicaid Rural Service Area.				

STAR+PLUS

Results from Table 26 indicate that at the beginning of the evaluation study period, STAR+PLUS experienced no substantive month-to-month change in the rate of potentially preventable emergency room rates, either before or after MMC expansion. However, immediately after MMC expansion, every STAR+PLUS SDA rate doubled significantly from 11 to 27 potentially preventable emergency room visits per month.

Table 26. Interrupted time series results for STAR+PLUS - Potentially Preventable Emergency Room visits per 1,000 member months

	Potentially Preventable Emergency Room Rate per 1,000 member months (Baseline level)	Trend before MMC expansion	Level change after MMC expansion	Trend after MMC expansion
STAR+PLUS Service Delivery Areas				
El Paso	9.71	**0.17**	**17.59**	0.04
Hidalgo	9.13	0.04	**11.77**	0.06
Lubbock	24.04	0.10	**22.95**	-0.06
MRSA Central	26.69	-0.13	**27.78**	-0.06
MRSA Northeast	28.91	**-0.14**	**26.82**	0.17
MRSA West	21.86	0.10	**24.69**	-0.15
Note: Values in bold indicate statistical signifance at *P* < 0.05 level. MRSA = Medicaid Rural Service Area.				

Preventable Hospital Readmissions

STAR

Preventable hospital readmissions for eligible populations decreased in all SDAs except for the MRSA Northeast SDA (Table 27).

Table 27. Descriptive trend results for STAR - preventable hospital readmissions per 1,000 members

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
STAR Service Delivery Areas			
Hidalgo	1.05	0.98	-0.07
MRSA Central	3.27	1.05	-2.22
MRSA Northeast	0.97	1.04	0.07
MRSA West	1.23	1.04	-0.20
Note: MRSA = Medicaid Rural Service Area.			

STAR+PLUS

Preventable hospital readmissions for STAR+PLUS eligible populations decreased in all SDAs except for El Paso SDA (Table 28).

Table 28. Descriptive trend results for STAR+PLUS - preventable hospital readmissions per 1,000 members

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
STAR+PLUS Service Delivery Areas			
El Paso	49.36	56.98	7.62
Hidalgo	57.62	49.40	-8.22
Lubbock	69.49	60.28	-9.21
MRSA Central	57.42	53.59	-3.82
MRSA Northeast	64.46	51.85	-12.62
MRSA West	59.88	54.54	-5.35
Note: MRSA = Medicaid Rural Service Area.			

Pharmacy Benefit Carve-In - Asthma Hospitalizations

STAR

Hospitalizations from asthma decreased from pre- to post- expansion of pharmacy benefits carve-in (Table 29).

Table 29. Descriptive trend results for STAR - Asthma Hospitalizations per 1,000 members

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
STAR Service Delivery Areas			
Hidalgo	0.39	0.18	-0.21
MRSA Central	0.50	0.39	-0.11
MRSA Northeast	0.42	0.29	-0.14
MRSA West	0.45	0.34	-0.11
Note: MRSA = Medicaid Rural Service Area.			

STAR+PLUS

Hospitalizations from asthma increased for all but Hidalgo SDA from pre- to post- expansion of pharmacy benefits carve-in (Table 30).

Table 30. Descriptive trend results for STAR+PLUS - Asthma Hospitalizations per 1,000 members

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
STAR+PLUS Service Delivery Areas			
El Paso	23.18	29.86	6.69
Hidalgo	22.06	1.00	-21.07
Lubbock	37.53	44.31	6.78
MRSA Central	26.11	36.99	10.88
MRSA Northeast	20.02	24.89	4.87
MRSA West	22.30	25.07	2.78
Note: MRSA = Medicaid Rural Service Area.			

Pharmacy Benefit Carve-In - Severe Persistent Mental Illness (SPMI) Hospitalizations

STAR

Hospitalizations from SPMI increased from pre- to post- expansion of pharmacy benefits carve-in (Table 31).

Table 31. Descriptive trend results for STAR - Severe persistent mental illness (SPMI) hospitalizations per 1,000 members

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
STAR Service Delivery Areas			
Hidalgo	2.67	3.13	0.46
MRSA Central	2.22	4.08	1.86
MRSA Northeast	2.41	3.64	1.23
MRSA West	3.11	3.94	0.83
Note: MRSA = Medicaid Rural Service Area.			

STAR+PLUS

Overall, hospitalizations from SPMI decreased from pre- to post-expansion of the pharmacy benefits carve-in, except for in the El Paso SDA (Table 32).

Table 32. Descriptive trend results for STAR+PLUS - Severe persistent mental illness (SPMI) hospitalizations per 1,000 members

	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change
STAR+PLUS Service Delivery Areas			
El Paso	64.29	81.58	17.29
Hidalgo	147.14	10.02	-137.12
Lubbock	159.82	96.40	-63.42
MRSA Central	127.49	104.21	-23.28
MRSA Northeast	175.45	88.43	-87.02
MRSA West	109.38	80.25	-29.12
Note: MRSA = Medicaid Rural Service Area.			

STAR - Behavioral Health Services and Quality of Care

Targeted case management was carved into STAR September 1, 2014. Table 33 displays results of the difference-in-difference analysis comparing targeted case management as a predictor of the number of hospitalizations approximately two years before (October 1, 2012 - August 31, 2014) and one year after (September 1, 2014 - September 30, 2015) the carve-in post-expansion between NorthSTAR (comparison) members and STAR members in the rest of the state of Texas (case). While there was a decrease in hospitalizations among both groups, STAR members who received targeted case management experienced a statistically significantly higher number of hospitalizations as compared to their counterparts in NorthSTAR.

Table 33. Difference-in-difference analysis: Targeted Case Management as a predictor of hospitalizations in case (Texas) and comparison (NorthSTAR) for STAR members

STAR	STAR Statewide (Case)			NorthSTAR (Comparison)			Between-Group Difference		
	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Unadjusted	Adjusted	(95% Confidence Interval)
	(N = 56,031)	(N = 41,297)		(N = 2,540)	(N = 1,285)				
Number of Hospitalizations	0.02	0.01	-0.01	0.08	0.02	-0.06	0.04	**0.62**	**(0.02 - 1.21)**

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. Adjusted models include sex, age, and race.

STAR+PLUS - Behavioral Health Services and Quality of Care

Targeted case management was carved into STAR+PLUS at the same time as STAR. The pre and post timeframes are the same as those reported for STAR above. Table 34 displays results of the difference-in-difference analysis comparing the likelihood of having a hospitalization (hospitalized or not hospitalized) pre- and post-carve-in between NorthSTAR (comparison) members and STAR+PLUS members in the rest of the state of Texas (case). Hospital events decreased for both groups, but there was a statistically significant greater likelihood of being hospitalized post-carve-in for STAR+PLUS members in the state of Texas, as compared to the NorthSTAR program.

Table 34. Difference-in-difference analysis: Targeted Case Management as a predictor of the likelihood of a hospital event in case (Texas) and comparison (NorthSTAR) for STAR+PLUS members

STAR+PLUS	STAR+PLUS Statewide (Case)			NorthSTAR (Comparison)			Between-Group Difference		
	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Pre-Medicaid Managed Care Expansion	Post-Medicaid Managed Care Expansion	Change	Unadjusted	Adjusted	(95% Confidence Interval)
	(N = 77,049)	(N = 67,575)		(N = 2,217)	(N = 1,137)				
Hospitalization Event	0.03	0.02	-0.01	0.06	0.02	-0.04	0.03	**0.67**	**(0.0854 - 1.259)**

Note: Values in bold indicate statistical signifance at $P < 0.05$ level. Adjusted models include sex, age, and race.

STAR - Child Client Satisfaction with Health Plan

STAR child respondents to the CAHPS® survey have been consistent in rating their child's health plan as a 9 or 10 on a scale of 0 (worst) to 10 (best) before and after implementation of the Demonstration. Results in Table 35 indicate that 79.0%, 80.5%, 78.2%, and 81.3% of respondents provided this rating in SFY 2009, SFY 2011, contract year (CY) 2013, and CY 2015, respectively. Additionally, in CY 2015, the CAHPS® survey was stratified by the MRSAs and 83.1% and 79.2% of respondents in MRSA Central and MRSA West, respectively, provided this rating.

Table 35. Self-reported rating of health plan - STAR - child

	SFY 2009	SFY 2011	CY 2013	CY 2015	
CAHPS® Survey Question					
Percent of clients who rated their health plan as 9 or 10 on a scale of 0 (worst) to 10 (best)	79.0%	80.5%	78.2%	Overall	81.3%
				MRSA Central	83.1%
				MRSA Northeast	LD
				MRSA West	79.2%
CAHPS® = Consumer Assessment Of Healthcare Providers and Systems. SFY = State fiscal year. CY = Contract year. MRSA = Medicaid Rural Service Area. LD = Low denominator.					

STAR - Adult Client Satisfaction with Health Plan

STAR adult respondents to the CAHPS® survey have been consistent in rating their health plan as a 9 or 10 on a scale of 0 (worst) to 10 (best) since the implementation of the Demonstration. Results in Table 36 indicate that before the Demonstration in SFY 2009, 53.9% of clients rated their health plan as a 9 or 10. After implementation of the Demonstration, in CY 2012, CY 2014, and CY 2016, 60.0%, 61.3%, and 61.1% of respondents, respectively, provided this rating. In recent years, the CAHPS® survey was stratified by the MRSAs. In CY 2014, 61.1%, 55.6%, and 61.2% of respondents rated their health plan as a 9 or 10 in the MRSA Central, MRSA Northeast, and MRSA West SDAs, respectively. In CY 2016, this increased slightly to 66.7% and 57.5% in the MRSA Central and MRSA Northeast SDAs, respectively.

Table 36. Self-reported rating of health plan - STAR - adult

	SFY 2009	CY 2012	CY 2014		CY 2016	
CAHPS® Survey Question						
Percent of clients who rated their health plan as 9 or 10 on a scale of 0 (worst) to 10 (best)	53.9%	60.0%	Overall	61.3%	Overall	61.1%
			MRSA Central	61.1%	MRSA Central	66.7%
			MRSA Northeast	55.6%	MRSA Northeast	57.5%
			MRSA West	61.2%	MRSA West	LD
CAHPS® = Consumer Assessment Of Healthcare Providers and Systems. SFY = State fiscal year. CY = Contract year. MRSA = Medicaid Rural Service Area. LD = Low denominator.						

STAR+PLUS - Client Satisfaction with Health Plan

STAR+PLUS adult respondents to the CAHPS® survey have slightly increased in rating their health plan as a 9 or 10 on a scale of 0 (worst) to 10 (best) since the implementation of the Demonstration. Results in Table 37 indicate that before the Demonstration in SFY 2009, SFY 2010, and SFY 2011; 50.2%, 51.0%, and 53.0% of clients rated their health plan as a 9 or 10. After implementation of the Demonstration, in SFY 2012, CY 2014, and CY 2016; 55.0%, 56.5%, and 57.6% of respondents, respectively, provided this rating. In CY 2016, the CAHPS® survey was stratified by the MRSAs. In CY 2016, 55.9%, 53.2%, and 61.1% of respondents rated their health plan as a 9 or 10 in the MRSA Central, MRSA Northeast, and MRSA West SDAs, respectively.

Table 37. Self-reported rating of health plan - STAR+PLUS adult

	SFY 2009	SFY 2010	SFY 2011	SFY 2012	CY 2014	CY 2016	
CAHPS© Survey Question							
Percent of clients who rated their health plan as 9 or 10 on a scale of 0 (worst) to 10 (best)	50.2%	51.0%	53.0%	55.0%	56.5%	Overall	57.6%
						MRSA Central	55.9%
						MRSA Northeast	53.2%
						MRSA West	61.1%
CAHPS© = Consumer Assessment Of Healthcare Providers and Systems. SFY = State fiscal year. CY = Contract year. MRSA = Medicaid Rural Service Area.							

Nursing Facility Benefit Carve-In

On March 1, 2015, Texas HHSC began delivering nursing facility benefits for most adults ages 21 and older through the STAR+PLUS healthcare delivery model.

An analytic dataset was created by identifying STAR+PLUS clients in each SDA who had been in a nursing facility. Evaluators compared the one year of post-expansion data (FFY 2015) to two years of pre-expansion data (FFY 2013 and FFY 2014). Quality of care was operationalized

as the rate of inpatient hospitalizations per 1,000 nursing facility clients. The percent of STAR+PLUS clients residing in nursing facilities ranged from 4.83% in FFY 2013, 4.87% in FFY 2015, and 5.53% in FFY 2015. Inpatient hospitalization rates were 368 per 1,000 nursing facility members in FFY 2013, 305 per 1,000 nursing facility members in FFY 2014, and 364 per 1,000 nursing facility members in FFY 2015. Because nursing facility benefits have been carved-in MMC for one year, it is premature to report any conclusions regarding quality of care in this evaluation report.

EVALUATION GOAL 4: EFFICIENCY IMPROVEMENTS AND COSTS

Managed care organizations (MCOs) are required to report their annual revenue from HHSC contracts, and the corresponding allowable expenses to the Texas Health and Human Services Commission (HHSC). Texas utilizes the experience rebate (ER) for this reporting. Another method for MCO reporting is the medical loss ratio (MLR).

ER and MLR: Cost-effective Spending verses Maximizing Medical Expenses

Managed care aims to spend some administrative money in order to make medical expenses more effective. Ideally, the organization spends a dollar on administrative functions which enable it to appropriately save more than one dollar in medical expenses. To the extent it is successful in doing this, its MLR will get "worse." By focusing on medical expenses as a percentage of premiums, the MLR tool effectively treats medical expenses as "good costs," and administrative expenses as "bad costs," and thus is counter-productive to the goal of "managed" care.

As a methodology to induce cost-effective spending by MCOs, the ER operates in conjunction with the Administrative Expense Cap, which limits administrative expenses included in the ER calculation. The ratio of the medical expenses to this final net premium payment amount is the portion of the premium spent on medical expenses. This ratio in Texas tends to be above the recommended ratio of medical expenses as called-for in the MLR standards and is actuarially sound.

Additionally, the MLR is structured to be both a comparative measurement tool and also an optional method to recover potential "excess" premium payment if rates turn out to be too high. These two goals are conflicting. In order for the comparative measurement tool to work best, certain abnormal situations would be omitted from the data. For example, CMS rules allow for new programs or new MCOs to be exempt during the first year. However, it is during these exact situations that protection from potential overpayments is most needed, and under the MLR, that is lost. So re-captured premiums (recoupment) from inadvertent overpayments would be lost for that year.

ER and MLR Calculations

Table 38 provides the detailed and annotated calculations for Amerigroup for SFY2014. In SFY2014 Amerigroup's total net HHSC contract revenue was $2.7B, the corresponding total expenses were $2.4B, and the total net contract income was $291M.

- **Experience Rebate:** A net income of $291M equals 11 percent of the total net revenue and was well over the three percent allowed under the ER model. Therefore, Amerigroup was required to pay Texas back $100M of this revenue.
- **Medical Loss Ratio:** Amerigroup spent 81.5 percent of its revenue on direct care. Under the MLR provision Amerigroup would be required, as a large insurer, to spend 85 percent of its revenue on direct care. Under an MLR provision, due to the "under-spending" of 3.5 percent, Amerigroup would have had to have returned $98M to Texas.
- **Difference:** Under the ER model, Amerigroup returned $2.23M more than they would have returned under the MLR provision.

Detailed calculations for all 19 Medicaid MCOs in Texas for SFY2012–2013 and SFY2014 can be found in the supplemental materials (Tables 60 - 79).

Table 38. Summarized Amerigroup State Fiscal Year 2014 Financial Statistical Report and Experience Rebate versus
Medical Loss Ratio Calculations

		Dollar Amounts in Thousands	Description
Financial Statistical Report			
Revenues			
A	Total Gross Revenues	$2,784,008	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$48,945	Premium and maintenance taxes
C	**Total Net Revenue**	**$2,735,063**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses			
D	Medical and Prescription Expenses	$2,228,532	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative Expenses	$215,365	Total administrative dollars reported by Managed Care Organization (MCO)
F	**Total Expenses**	**$2,443,897**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income			
G	**Net Income Before Taxes**	**$291,167**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation			
H	Administrative Percent	7.9%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	10.6%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:		
	< 3%	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$11,136	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$22,272	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$33,408	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$33,408	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	MCO Share: 0%; Texas Share: 100%
	Experience Rebate	**$100,224**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)			
J	MLR Percent	81.5%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	
L	MLR under target	3.5%	Target less calculated MLR percent (K-J=L)
M	**MLR Rebate**	**$97,994**	Percent of MLR under target times the total gross revenue (L*A=M)
Difference between Experience Rebate and MLR			
	Difference	**$2,230**	Experience Rebate – MLR Rebate

On an aggregate basis, across all MCOs, the amount of money returned under the ER model was greater than what would have been returned under the MLR provision for both SFY2012–13 and SFY2014 (see Figure 11).

- **SFY2012–SFY2013.** The MCOs returned $34.5M to Texas under the ER model. Under the MLR provision the MCOs would have returned $14.9M.
- **SFY2014.** Under the ER model, the MCOs returned $302M. Under the MLR provision the MCOs would have returned $243M.

The period SFY2012–SFY2013 included the expansion of the Texas MMC. This expansion to new geographic areas also included the carve-in of prescription benefits and the carve-in of the Children's Medicaid Dental program. During previous expansions, Texas has found that due to increased administrative burden related to the expansion, MCOs do not generate excess profits that would have resulted in an ER. As expected, overall MCO profitability during SFY2012–SFY2013 was nominal.

For the combined state fiscal years (SFY2012–SFY2014) the amount returned under the ER model was $336M, and for the same period, $258M would have been returned under the MLR provision. Using the ER model, MCOs returned $78M more than they would have returned under the MLR provision.

In addition, more MCOs were required to return money under the ER model than would have been required under the MLR provision (see Table 39). Of the 19 Texas Medicaid MCOs, only El Paso First, Aetna Better Health, Community First, Christus, and Parkland would have returned more money under the MLR provision compared to the ER model during either SFY2012–SFY2013 or SFY2014. There were eight MCOs in SFY2012–SFY2013 and seven in SFY2014 that did not return any money under the ER model and would not have returned money under the MLR provision.

Figure 11. Experience Rebate (ER) versus Medical Loss Ratio (MLR) for all Managed Care Organizations State Fiscal Years 2012 - 2014
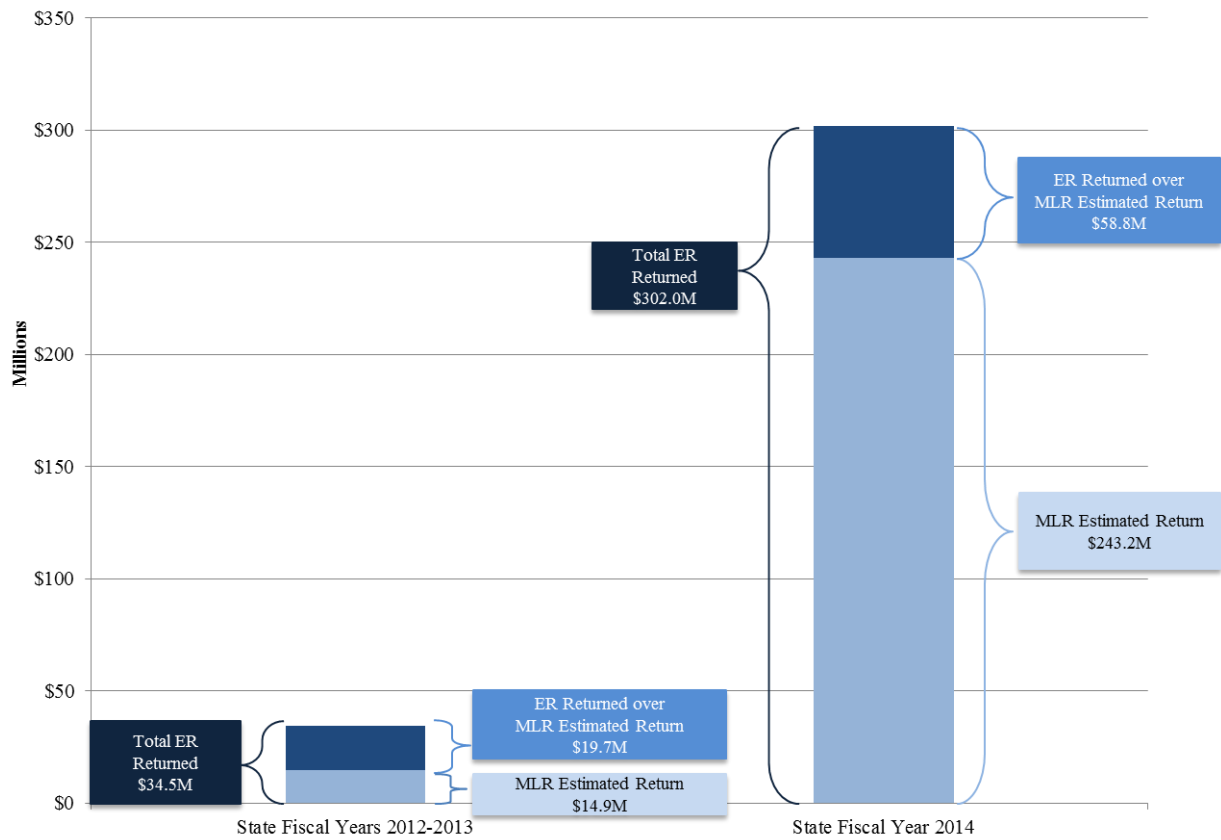
Table 39. Experience Rebate versus Medical Loss Ratio for Each Managed Care Organization State Fiscal Years 2012 - 2014

Managed Care Organizations (MCOs)	State Fiscal Years 2012-2013 (March 2012–September 2013) (in thousands)			State Fiscal Year 2014 (in thousands)		
	Experience Rebate	Medical Loss Ratio	Difference	Experience Rebate	Medical Loss Ratio	Difference
Aetna Better Health	$3,594	$1,170	$2,424	$22,575	$23,409	($835)
Amerigroup	$5,690	$0	$5,690	$100,224	$97,995	$2,229
Blue Cross/Blue Shield of Texas	$943	$0	$943	$24	$0	$24
Community First	$0	$0	$0	$10,123	$10,654	($531)
Community Health Choice	$0	$0	$0	$0	$0	$0
Christus	$5,969	$6,227	($258)	$1,488	$611	$877
Cook Children's	$0	$0	$0	$1,846	$0	$1,846
Driscoll Children's	$6,058	$4,764	$1,294	$0	$0	$0
El Paso First	$1,300	$2,691	($1,391)	$0	$0	$0
FirstCare	$0	$0	$0	$0	$0	$0
HealthSpring	$1,321	$0	$1,321	$1,867	$0	$1,867
Molina Healthcare	$4,030	$0	$4,030	$26,610	$14,140	$12,470
Parkland	$944	$0	$944	$17,096	$24,591	($7,497)
Scott & White	$0	$0	$0	$0	$0	$0
Sendero	$0	$0	$0	$0	$0	$0
Seton	$226	$0	$226	$1,235	$0	$1,235
Superior	$0	$0	$0	$74,304	$37,171	$37,134
Texas Children's Health Plan	$0	$0	$0	$0	$0	$0
UnitedHealthcare	$4,428	$0	$4,428	$44,576	$34,611	$9,965
ALL MCOs	**$34,503**	**$14,852**	**$19,650**	**$301,968**	**$243,180**	**$58,787**

Potential Improvements to the MLR and ER

To improve the MLR, the tool would need to; 1) combine medical and administrative costs; 2) have a different approach to protecting HHSC from administrative costs that are too high (such as HHSC's Administrative Cap); and 3) focus on profitability levels as the measure in which to recoup premium dollars.

If it were determined that the ER should be required to produce results with an even higher proportion of medical expenses, this could be done by adjusting the rebate sharing percentage tiers.

WAIVER AMENDMENTS

The draft final Evaluation Report covers the first four demonstration years through September 2015. Amendments to the Demonstration effective during or after 2016 were not included in this report (due January 31, 2017, STC 75(b)) due to a lack of time to collect sufficient data for evaluation purposes. Due to the diversity and varied timing of each of the amended populations and/or services, the draft Final Evaluation Report focuses on the specific Demonstration evaluation activities described in the approved evaluation plan.

CONCLUSIONS

MMC expansion supports Demonstration goals by building a foundation for an integrated healthcare delivery system that incentivizes quality, efficiency, and improves healthcare quality and outcomes for the Texas Medicaid population. Although MMC expansion statewide has been successful, the benefits offered continue to change, requiring further evaluation of services and populations added to MMC through the amendment process.

Key Achievements

- MMC delivery system was expanded statewide for STAR and dental services for children in March 2012 and STAR+PLUS in September 2014.
- 1915(c) and 1915(b) waivers were consolidated in the Demonstration, reducing multiple layers of regulation and reporting requirements, thereby reducing administrative burden and streamlining processes.
- Texas added new behavioral health benefits to MMC's existing behavioral health service array in September 2014, and nursing facility benefits in March 2015.
- A shift toward home- and community-based care for the MMC population has started and gained momentum.

Summary of Results

Evaluation Goal 1: Access to Care

Access to Primary Care Services

As Medicaid beneficiaries and healthcare benefits shifted from PCCM/FFS to MMC, access to primary care was maintained or increased for STAR and STAR+PLUS members in expansion SDAs. The greatest increases in access to care among children were found in the MRSAs. Specific access to primary care results include:

- STAR child and adolescent eligible members experienced an increase in access to primary care. Immediately and two years following the Demonstration implementation, access to primary care for children and adolescents in STAR experienced a statistically significant increase in MRSA SDAs. (Table 2)
- STAR+PLUS eligible members experienced an overall increase in access to preventive/ambulatory health services. Upon implementation of the Demonstration, the

MRSA Central and Northeast SDAs experienced an increase in access to care, while the MRSA West experienced a decrease in access to care. Two years following Demonstration implementation, the El Paso, Hidalgo, and MRSA Central SDAs have experienced a statistically significant month-to-month increasing trend in access to care. (Table 3)

- Rates of hospitalizations varied among STAR+PLUS eligible members in the expansion SDAs with Hidalgo and MRSA West SDAs experiencing increasing trends in hospitalizations prior to the Demonstration and decreasing trends after the Demonstration. Immediately following the Demonstration, the El Paso and MRSA Central SDAs experienced a sudden increase in hospitalizations. Two years following the Demonstration implementation, Hidalgo, Lubbock, and MRSA West SDAs have experienced statistically significant month-to-month decreases in hospitalizations. (Table 4)
- The leading diagnosis for inpatient hospitalizations among STAR+PLUS members shifted from "symptoms involving respiratory system and other chest symptoms" under FFS to behavioral health diagnoses as the most common under MMC.
- Access to care in terms of distance to the nearest acute care hospital for STAR+PLUS clients did not change with the MMC expansion. On average, members remain approximately four to six miles from an acute care hospital in the expansion SDAs. (Figure 8)

Access to Pharmacy Benefits

Access to medications for major depression, asthma, and schizophrenia improved for STAR and STAR+PLUS members, specifically:

- Among STAR and STAR+PLUS members, there was an increase of 2.41 and 2.73 percent, respectively, adherence to antidepressants medication in the acute phase and a small increase of 0.36 and 1.06 percent, respectively, in the proportion of members adherent to antidepressants during the continuation phase. (Table 5, Table 6)
- STAR program experienced a marked increase in the proportion of members with an asthma medication ratio (controller to total asthma medications) of 0.50 or greater, increasing from 8.57 percent of members before the Demonstration to 48.38 percent after the Demonstration. STAR+PLUS members experienced a similar increase: 10.21 percent of members pre- and 25.44 percent of members post-Demonstration achieved an asthma medication ratio of 0.50 or greater. (Table 5, Table 6)
- There was a very slight increase in the proportion of STAR members (0.61 percent) and an increase in the proportion of STAR+PLUS members (2.57 percent) adherent to antipsychotic medications for schizophrenia. (Table 5, Table 6)

Access and Utilization of Dental Benefits

There was an overall decrease in dental utilization, but FFS experienced greater declines than the MMC population. The majority of the Medicaid children receiving dental services were in FFS prior to the demonstration and in MMC upon implementation of the Demonstration. The overall decrease could be attributed to more efficient delivery of dental services under the MMC service delivery model, but a utilization review is necessary to determine this. Specific dental results include:

- The proportion of children with at least one dental visit in the past year decreased after implementation of the Demonstration, but over 55 percent of children had at least one visit, surpassing the Healthy People 2020 target of 49 percent. (Figure 9)

- Diagnostic dental services for children under 21 years decreased slightly from approximately 95 percent of clients SFY 2010 to just over 90 percent in SFY 2012, and increased back to pre-Demonstration levels in SFY 2013; these services continued to decrease to approximately 80 percent in 2013 among the FFS population, but were nearly back to pre-Demonstration levels of approximately 95 percent in 2014. (Figure 10)
- Restorative dental services experienced a decrease in the FFS population from approximately 41 percent prior to the Demonstration to just over 35 percent in SFY 2014. These services increased among the MMC population from approximately 35 percent prior to the Demonstration to 40 percent by SFY 2014. (Figure 10)
- Females had slightly higher utilization than males for nearly all age groups after age one. (Tables 7-14)
- African-American clients consistently had a higher rate of utilization than their Hispanic and White counterparts throughout the study period, and White clients had the lowest utilization throughout. (Tables 7-14)
- The percentage of children receiving two dental visits in the past year declined in the post-Demonstration period from a high of 38.8% in SFY 2011 to 33.4% in SFY 2014. (Table 15)
- The percentage of children receiving at least one topical fluoride application in the last year remained consistent from 42.5% in SFY 2010 to 44.8% in SFY 2014. (Table 16)

Evaluation Goal 2: Care Coordination

Overall, the Demonstration maintained pre-Demonstration levels or slightly increased levels of care coordination, with a decrease in some measures at the time of the shift from FFS/PCCM to MMC. MMC members across the state reported slight increases in the perception that their primary care providers were informed about care they received from other providers, and there was an increase in utilization of targeted case management services among STAR and STAR+PLUS members. Specific care coordination measures include:

- STAR child and adolescent care takers reported an increase in their perception of care coordination among providers. In SFY 2011, 70.1 percent of caretakers reported their child's providers were usually or always informed and up-to-date about the care their child received from other providers; this increased to 76.2% in CY 2015. (Table 17)
- STAR adult clients also reported an increase in their perception of care coordination. In SFY 2009, 63.3 percent of clients reported their doctors were usually or always informed about care they received from other doctors; this increased to 73.6 percent by CY 2016. (Table 18)
- STAR+PLUS adults' perception of care coordination among providers changed over time in that 72.9 percent of members reported their doctor was usually or always informed about care they received from other doctors; this decreased to a low of 67.5 percent in SFY 2012, and increased to 75.5 percent in CY 2016. (Table 19)
- Upon implementation of the Demonstration, ambulatory visits among existing (as opposed to new patient visits) members in STAR+PLUS experienced a statistically significant increase in MRSA Central and MRSA Northeast SDAs and a statistically significant decrease in the MRSA West SDA. Two years following the Demonstration implementation, the El Paso and Hidalgo SDAs experienced a statistically significant month-to-month increasing trend in ambulatory visits among STAR+PLUS members. (Table 20)
- Utilization of mental health rehabilitative services did not experience a statistically significant change when comparing the STAR and NorthSTAR programs. When compared to the NorthSTAR program, the STAR+PLUS program experienced approximately 2 percent increased utilization of these services. (Table 21, Table 22)

- Utilization of targeted case management increased approximately 2 percent among the STAR and STAR+PLUS programs as compared to the NorthSTAR program. (Table 21, Table 22)

Evaluation Goal 3: Quality of Care

Overall, the results were mixed in terms of quality of care measures from the pre- to the post-Demonstration periods. These measures represent intermediate health outcomes and it is expected these outcomes may experience a lag in terms of the Demonstration's impact on quality of care as compared to process measures (e.g., access to care or care coordination). It is expected that as access to care and care coordination continue to improve, quality of care results will follow.

Rates of potentially preventable hospitalizations, ED visits, and readmissions varied between STAR and STAR+PLUS and by SDA. There were sudden changes, positive and negative, upon implementation of the Demonstration, but rates of potentially preventable events generally remained steady or decreased two years following Demonstration implementation. Specific results for potentially preventable hospitalizations, ED visits, and readmissions include:

Potentially preventable hospitalizations, emergency department (ED) visits, and readmissions:

- Potentially preventable hospitalizations among the STAR eligible population in expansion SDAs were experiencing a slight month-to-month decrease prior to the Demonstration; in the two years following Demonstration implementation, these rates increased slightly, but the increasing trend was not statistically significant. (Table 23)
- Potentially preventable hospitalizations among the STAR+PLUS eligible population decreased in some expansion SDAs. The Hidalgo SDA experienced a sudden decrease upon Demonstration implementation and a small but statistically significant decrease trend continued two years post- Demonstration implementation. The MRSA Central and MRSA Northeast SDAs experienced a slight decreasing trend prior to Demonstration implementation. Two years following Demonstration implementation, MRSA Central demonstrated a non-statistically significant decreasing trend; while MRSA Northeast experienced a rate decrease upon Demonstration implementation, but a small statistically significant increasing trend two years following Demonstration implementation. (Table 24)
- Potentially preventable ED visits experienced a statistically significant increase in all STAR expansion SDAs upon Demonstration implementation, but the trend did not indicate a change in the potentially preventable ED rate two years following Demonstration implementation. (Table 25)
- Potentially preventable ED visits experienced an increase in all STAR+PLUS expansion SDAs upon Demonstration implementation, but the trend did not indicate a change in the potentially preventable ED rate two years following Demonstration implementation. (Table 26)
- Potentially preventable readmissions decreased slightly in all STAR expansion SDAs, except the MRSA Northeast SDA. The decreases ranged from 0.07 to 2.22 readmissions per 1,000 members in the Hidalgo and MRSA Central SDAs, respectively; while the rate increased by 0.07 readmissions per 1,000 members in the MRSA Northeast SDA. (Table 27)
- Potentially preventable readmissions decreased in all STAR+PLUS expansion SDAs, except the El Paso SDA. The decreases ranged from a reduction of 3.82 to 12.62 fewer potentially

preventable readmissions per 1,000 members in the MRSA Central and MRSA Northeast SDAs, respectively. Potentially preventable readmissions increased 7.62 readmissions per 1,000 members in the El Paso SDA. (Table 28)

Hospitalizations related to asthma, SPMI, and targeted case management:

Pharmacy benefits and targeted case management were carved-in and were new benefits to MMC upon Demonstration implementation. If asthma and SPMI clients' access to medications and targeted case management improved with the Demonstration, rates of hospitalizations due to these conditions were expected to decrease. Results were mixed for the STAR and STAR+PLUS eligible populations, depending on the condition. Hospitalizations decreased among members receiving targeted case management, but decreases were greater among the NorthSTAR members than those experienced by STAR and STAR+PLUS eligible members. Specific results related to hospitalizations due to asthma, SPMI, and targeted case management include:

- Hospitalizations due to asthma decreased slightly in all STAR expansion SDAs in the post-Demonstration period. Hospitalizations due to asthma ranged from 039 to 0.50 per 1,000 members in the Hidalgo and MRSA Central SDAs prior to the Demonstration. The decrease ranged from 0.11 to 0.21 hospitalizations per 1,000 members in the MRSA Central and MRSA West, and Hidalgo SDAs, respectively. (Table 29)
- Hospitalizations due to asthma increased in all STAR+PLUS SDAs, except the Hidalgo SDA. The pre-Demonstration rate of hospitalizations due to asthma ranged from 20.02 to 37.53 in the MRSA Northeast and Lubbock SDAs, respectively. The increases ranged from 2.78 to 10.88 additional hospitalization per 1,000 members in the MRSA West and MRSA Central SDAs, respectively. (Table 30)
- Hospitalizations due to SPMI increased among the STAR population in expansion SDAs. Pre-Demonstration levels ranged from 2.22 to 3.11 hospitalizations per 1,000 members in the MRSA Central and MRSA West SDAs, respectively; while post-Demonstration rates ranged from 3.13 to 4.08 hospitalizations in the Hidalgo and MRSA Central SDAs, respectively. (Table 31)
- Hospitalizations due to SPMI decreased drastically in all but one expansion SDA. Pre-Demonstration hospitalizations ranged from 64.29 to 175.45 per 1,000 members in the El Paso and MRSA Northeast SDAs; while post-Demonstration hospitalizations ranged from 10.02 to 104.21 per 1,000 members in the Hidalgo and MRSA Central SDAs, respectively. (Table 32)
- There was a slight decrease in hospitalizations among STAR and NorthSTAR programs receiving targeted case management services. The reduction was greater among the NorthSTAR program than among the STAR program in that STAR clients receiving targeted case management experienced an additional 0.62 hospitalizations when compared to NorthSTAR members receiving targeted case management. (Table 33)
- There was a slight decrease in the likelihood of experiencing a hospitalization among the STAR+PLUS and NorthSTAR programs receiving targeted case management. The decrease was greater among the NorthSTAR program when compared to the STAR+PLUS program as STAR+PLUS clients receiving targeted case management were 0.67 times more likely to experience a hospitalization than NorthSTAR clients receiving targeted case management services. (Table 34)

- In a survey of MMC members, individuals are asked to rate their MCO on a scale from 0 (lowest) to 10 (highest). This statewide survey is conducted at regular intervals samples of the STAR and STAR+PLUS populations. As MMC expanded statewide, members in expansion SDAs were included in the statewide samples. Members who rated their MCO as a 9 or 10 remained steady or increased over time:
    - Approximately 80 percent of STAR child caregivers were satisfied with their child's STAR MCO from the pre- to the post-Demonstration period. (Table 35)
    - STAR adult satisfaction with their MCO increased from 53.9 percent in SFY 2009 to 60-61 percent from CY 2012 and later. (Table 36)
    - STAR+PLUS member satisfaction steadily increased from 50.2 percent in SFY 2009 to 57.6 percent CY 2016. (Table 37)
- Nursing facility benefits were carved-in to STAR+PLUS on March 1, 2015. Based on one year of post-carve-in data, hospitalizations among nursing facility members were 368, 305, and 364 per 1,000 nursing facility members in FFYs 2013, 2014, and 2015, respectively. More time is needed to determine the impact of the nursing facility carve-in on STAR+PLUS members.

Evaluation Goal 4: Efficiency Improvements and Costs

Overall, the Demonstration resulted in improved efficiency and cost as related to MCO cost containment:

- Overall, more money was returned to HHSC (and ultimately to CMS) under the Experience Rebate model as compared to the Medical Loss Ratio provision. (Table 39)

Ongoing Challenges

Results from the Demonstration stakeholder surveys (Evaluation Goals 10 - 11) indicate room for improvement:

- Stakeholders expressed dissatisfaction with Managed Care Organization (MCO) administration/staff levels, inefficient MCO credentialing process, and processing time for claims and payment (especially for clients needing urgent behavioral health services or primary care).
    - o Recommendations include streamlining Medicaid:
        - ▪ provider regulations,
        - ▪ enrollment procedures,
        - ▪ prior authorization policies,
        - ▪ credentialing, and
        - ▪ claims processing rules.
- Providers recommended standardizing policies and processes across MCOs.
- An unintended consequence of the policy allowing clients to change MCOs every 30 days has led to provider frustration related to increased administrative burden for service payment.

At the start of the five-year demonstration period, Texas hypothesized initial changes for process outcomes would occur before discernable changes were detected with intermediate outcomes. The overarching long-term impact of the Demonstration is to maintain/improve health outcomes while containing cost growth; however, long-term impacts such as these require longer time spans than the Demonstration's timeline to produce noticeable impacts. As a result, the evaluation focused on assessing process measures and their associated intermediate health outcomes. Findings showed larger effect sizes for process outcomes and smaller effect sizes for intermediate health outcomes. This lends credence to Texas' hypothesis of greater impact occurring to process outcomes first before influencing changes to intermediate health outcomes. Connections between process and intermediate health outcomes suggests that improving process measures will lead to potential health impacts in the future.

Strengths and Limitations

A key strength of this evaluation is the reliance on population level data for each expanded program and SDA. MMC impacts at the SDA level captured the geographic variation in health care delivery. Sentinel performance measures were selected that have been well-established in the public health literature and MMC impacts on access, quality, and care coordination were evaluated using advanced quasi-experimental statistical analyses. Most measures used in Appendix B have been designed and validated to be used specifically with administrative claims data.

While population level data is a strength of this evaluation, the reliance is on administrative claims, which is a limitation. Administrative claims data have been identified as an easily accessible way to measure quality of care; however, billing is the original intended purpose. While administrative data might be able to identify key cases and describe statistical trends, it is usually limited in providing finer detailed health or health behavior information. For example, claims data can identify patients who have received a diagnosis of diabetes, but fails to discern the patient's physical and dietary habits and subtleties of their diabetes control regimen, which could be valuable when evaluating quality of care (Amin, 2013). Using these data types allowed Texas to evaluate the question of whether there was a change in quantitative trends before and after the Demonstration. However, administrative data are limited in explaining the contextual operations involved in "why" or "how" changes occurred. Additionally, even though trends might be statistically significant, some effect sizes may not represent meaningful changes at the program level.

Pharmacy claims data were used for analyzing medication adherence (Taitel, 2012), which is standard for calculating medication adherence since it serves as a proxy for actual medication use. However, this cannot definitively state whether a patient took medications as prescribed. As a result, the proportion of days covered (PDC) calculation used for medication adherence analysis might overestimate true adherence rate because it assumes patients took all their medication as intended (Yeaw, 2009). This is true of all medication adherence methods that do not triangulate data by taking blood samples of patients to confirm presence of medication. One strength to these findings is there were no known changes to prescribing guidelines during the time of the expansion.

Due to program implementation, it was sometimes impossible to have a consistent comparison group to minimize threats to internal validity. While randomized controlled studies were not feasible, alternative comparison groups were utilized when possible to add confidence to evaluation results.

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SUPPLEMENTAL MATERIALS

TEXAS LEGISLATIVE CHANGES

The 2012-2013 General Appropriations Act, House Bill (H.B.) 1, 82nd Legislature, Regular Session, 2011 (Article II, Health and Human Services Commission, Rider 51) and Senate Bill (S.B.) 7, 82nd Legislature, First Called Session, 2011 required the Texas Health and Human Services Commission (HHSC) to expand MMC to include additional Medicaid clients to improve budget efficiency. At the same time, the provision of uncompensated care (UC) in Texas was increasing, prompting the state to commission a large-scale system transformation (Texas Health and Human Services Commission, 2012b).

To fulfill this directive, HHSC submitted a proposal to the Centers for Medicare and Medicaid Services (CMS) for a five-year Section 1115(a) demonstration waiver. Research and demonstration 1115 waivers allow states to waive a variety of program requirements, such as comparability or statewideness, to test new ideas for operating their respective Medicaid programs. States may use these waivers to structure statewide health system reforms and to test the value of new services or service delivery mechanisms in terms of cost-effectiveness and efficacy.

Possible interventions allowed in a Section 1115 demonstration waiver include:

• The expansion of eligibility to individuals who are not otherwise enrolled in Medicaid or the Children's Health Insurance Program (CHIP),

• The provision of services not typically covered by Medicaid, and

• The implementation of programs that encourage innovative service delivery systems with the goals of improving care, increasing efficiency, and reducing health care costs.

Waivers are required to be budget neutral to the federal government for the duration of the demonstration and are usually for five years, subject to renewal or extension. CMS also requires states to conduct comprehensive evaluations on the efficacy of their 1115 waivers.

CMS approved the Texas Healthcare Transformation and Quality Improvement Program waiver ("Demonstration") on December 12, 2011. The Demonstration is ongoing and, unless Texas is granted a waiver extension or renewal, will end on December 31, 2017.

Table 40 provides information on the Texas MMC program since 2011, when the Texas Legislature authorized the Texas Health and Human Services Commission (HHSC) to apply for the 1115(a) waiver, and details programmatic changes through September 2016.

Table 40. Texas Medicaid Managed Care (MMC) Programmatic Changes since 2011

Date	Enacting State Legislation	Change
6/2011	House Bill (H.B.) 1, 82nd Legislature, Regular Session, 2011	Authorized the HHSC to expand MMC to include additional Medicaid clients to improve budget efficiency.
8/2011		HHSC eliminated Primary Care Case Management in the 28 contiguous counties to the existing service delivery areas (SDAs).
9/2011		STAR expanded to 17 counties contiguous to Bexar, El Paso, Lubbock, Nueces, and Travis SDAs and STAR+PLUS expanded to 10 counties contiguous to the Bexar, Harris, Nueces, and Travis SDAs. STAR and STAR+PLUS expanded to the newly formed Jefferson SDA.
9/2014	Senate Bill (S.B.) 7, 83rd Legislature, Regular Session, 2013	STAR+PLUS expanded to the Medicaid Rural Service Areas, integrating acute care and long-term services and supports for individuals 65 and older and those with disabilities. Most adults with intellectual and developmental disabilities (IDD) being served through one of the 1915(c) waivers for individuals with IDD or living in a community-based Intermediate Care Facility (ICF)/IID began receiving acute care services through STAR+PLUS. Mental health rehabilitation and mental health targeted case management services carved into MMC.
3/2015	S.B. 58, 83rd Legislature, Regular Session, 2013	Nursing facility services now delivered through the STAR+PLUS managed care model to most adults age 21 and over.
3/2015		HHSC implemented the Texas Dual Eligible Integrated Care Project (known as the Dual Demonstration), a fully integrated managed care model for individuals enrolled in Medicare and Medicaid.
2016	S.B. 7, 83rd Legislature, Regular Session, 2013	HHSC implemented a new MMC program, STAR Kids, for children with disabilities, including children who are receiving benefits under the Medically Dependent Children Program.

Table 41. Performance Measure Technical Details

Performance Measure/Indicator	Measure Source	Measure development or adaptation from data source
Children and Adolescent access to primary care (CAP) services	2014 HEDIS® Technical specifications	The Children and Adolescents' Access to Primary Care (CAP) measure calculates the "percentage of members 12 months – 19 years of age who had a visit with a primary care practitioner (PCP) during the measurement year" (National Committee for Quality Assurance, 2013, pp. 232) A "CAP-like" measure was created to better align with the Demonstration. The CAP-like measure was created for the STAR population by making two adaptations to the HEDIS® 2014 Technical Specifications (National Committee for Quality Assurance, 2013). 1. To align with demonstration year (DY) and federal fiscal year (FFY), the evaluation used September 30 as the anchor date. 2. The definition of PCP was defined according to the PCP provider types and provider specialty codes outlined in the MAXIMUS Medicaid Managed Care and CHIP Joint Interface Plan EB 724 (2015).
Adult access to preventive/ambulatory health services (AAP)	2014 HEDIS® Technical specifications	The adult access to AAP measures members who had an ambulatory or preventive care visit in the past year. The 2014 HEDIS® measures were calculated for STAR+PLUS members annually by healthcare delivery model (FFS, PCCM, and MMC) and SDA over the FFYs and compared to baseline years using the HEDIS® (National Committee for Quality Assurance, 2013) value sets. However, a few minor modifications were made to the HEDIS® methodology to better align with the Demonstration. STAR+PLUS eligible members 65 years and older Medicare/Medicaid (dual eligible) were excluded from the analysis. 1. In order to be consistent with Demonstration DY, FFY was used as the measurement year, instead of the calendar year, making September 30, the anchor date. 2. Continuous enrollment was defined as no more than a one-month gap in coverage during the measurement year (HEDIS® requirement). Rates were reported as the number of ambulatory visits per 1,000 enrollee member months by SDA
Number of STAR+PLUS members who had inpatient hospital stays per 1,000 members	HHSC	The numerator consisted of clients meeting the standard definition of hospital inpatient is a person who is provided room, board, and continuous general nursing service in an area of the hospital where patients generally stay at least overnight (42 U.S.C. § 1395x (b)). The denominator consisted of clients eligible to receive Medicaid services.
Average number of miles from STAR+PLUS members to closest participating inpatient hospital in each new service area	HHSC	An acute care hospital is a hospital that provides inpatient medical care and other related services for surgery, acute medical conditions or injuries (usually for a short-term illness or condition). An inpatient stay means that a client had at least a 24-hour stay in a facility licensed to provide Hospital care. Acute care hospital providers were identified by nine Standard Program Codes. {table below}

Medicaid Standard Program Code	Acute Care Hospital Specialty Type Description
80	Children's Hospital
81	Hospital – Teaching Affiliate
83	Hospital – Profit/Acute (1–50 beds)
84	Hospital – Profit/Acute (51–100 beds)
86	Hospital – Profit/Acute (101 and more beds)
89	Hospital – Nonprofit/Acute (1–50 beds)

Performance Measure/Indicator	Measure Source	Measure development or adaptation from data source	
		90	Hospital – Nonprofit/Acute (51–100 beds)
		91	Hospital – Nonprofit/Acute (101–250 beds)
		92	Hospital – Nonprofit/Acute (251 and more beds)
Number of adult members with Serious Persistent Mental Illness receiving Mental Rehabilitative Services Ages 03 - 64	HHSC	HHSC defines SPMI as "schizophrenia, major depression, bipolar disorder or other severely disabling mental order" and "Children and adolescents ages 3 through 17 years with a diagnosis of a mental illness or who exhibit a serious emotional disturbance." Clients who met SPMI criteria were queried in order to determine if they ever received mental rehabilitative services.	
Preventable hospital admissions	HHSC	The ACSC specifications used to calculate these measures are adapted from AHRQ's Prevention Quality Indicators (PQIs) version 5.0 which measure potentially avoidable hospitalizations for ACSCs. Diagnoses were coded using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). Additional ACSC measures were added to the list of AHRQ PQIs in order to maintain consistency with other Texas HHSC healthcare quality reports. A detailed list of conditions and related ICD-9-CM codes can be found in Table 53.	
Percent of children's Medicaid dental services members who receive at least one fluoride treatment in one calendar year	2012 TMHP Provider Manual	A detailed list of current procedural terminology codes can be found in Table 52. Children who had obtained these services were included in the numerator. The denominator consisted of all children 0-20 years who were eligible to receive dental services.	
Percent of children's Medicaid dental services members who receive at least one diagnostic dental service in one calendar year	2012 TMHP Provider Manual	A detailed list of current procedural terminology codes can be found in Table 52. Children who had obtained these services were included in the numerator. The denominator consisted of all children 0-20 years who were eligible to receive dental services.	
Number of members who use appropriate medications for people with asthma (according to NCQA)	2014 HEDIS® Technical specifications	AMR - Asthma Medication Ratio - To align with demonstration year (DY) and federal fiscal year (FFY), the evaluation used September 30 as the anchor date. Clients had to have had a principal diagnosis through diagnosis five of asthma.	
Number of SPMI members adherent to antipsychotic medications	2014 HEDIS® Technical specifications	SAA - Adherence to Antipsychotic medications for Individuals with schizophrenia 1. Includes individuals with bipolar disorder 2. Used the NCQA list of antipsychotic medications for both schizophrenia and bipolar disorder [See Table SSD-D: Antipsychotic Medications. http://www.ncqa.org/hedis-quality-measurement/hedis-measures/hedis-2014/hedis-2014-final-ndc-lists] 3. To align with demonstration year (DY) and federal fiscal year (FFY), the evaluation used September 30 as the anchor date. 4. Administrative specification was adapted to include bipolar disorder.	
Number of SPMI members adherent to antidepressant medications	2014 HEDIS® Technical specifications	AMM - Antidepressant Medicaid Management 1. To align with demonstration year (DY) and federal fiscal year (FFY), the evaluation used September 30 as the anchor date.	
Rate of STAR+PLUS clients with existing patient claims for Ambulatory visits	2014 HEDIS® Technical specifications	The 2014 HEDIS® AAP measure consists of four different types of ambulatory visits; new patients, existing patients, home patients, and other ambulatory visits. HHSC researchers calculated monthly ambulatory rates for existing patients.	

Performance Measure/Indicator	Measure Source	Measure development or adaptation from data source
Rate of members with Serious Persistent Mental Illness receiving Targeted Case Management Ages 03 - 64 per 1,000 members	HHSC	HHSC defines SPMI as "schizophrenia, major depression, bipolar disorder or other severely disabling mental order" and "Children and adolescents ages 3 through 17 years with a diagnosis of a mental illness or who exhibit a serious emotional disturbance." Clients who met SPMI criteria were queried in order to determine if they ever received targeted case management services.
Number of preventable emergency department visits per 1,000 members	HHSC	All ED-related claims and encounters were defined using the following Current Procedural Terminology (CPT) codes, revenue codes, and place of service codes. The CPT codes included the ED physician services (99281–99285). The revenue codes included ED facility charges (revenue codes 450–452, 456, 459, and 981). The place of service (POS) code included ED (POS code 23) for managed care organization encounters only (there is no equivalent place of service code for FFS claims).[11] Primary ICD-9-CM diagnosis codes and five secondary diagnoses were obtained for all ED claims. ED visits for ACSC were included in the analysis. An algorithm based on CPT and diagnosis codes was used to identify ED claims for ACSC. ACSC procedure codes included ED physician services for minor, low, and moderate severity (procedure codes 99281–99283). ICD-9-CM codes used to identify ACSCs are detailed in Table 53.
Number of preventable hospital admissions per 1,000 members	HHSC	Diagnoses were coded using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). Additional ACSC measures were added to the list of AHRQ PQIs in order to maintain consistency with other Texas HHSC healthcare quality reports. A detailed list of conditions and related ICD-9-CM codes can be found in Table 53.
Number of preventable hospital readmissions per 1,000 members	HHSC	Additional ACSC measures were added to the list of AHRQ PQIs in order to maintain consistency with other Texas HHSC healthcare quality reports. A detailed list of conditions and related ICD-9-CM codes can be found in Table 53. • For all clients with multiple hospital admissions, a 30-day period was used to determine the time period from the initial admission and potential readmission. • Next a clinical relationship between the initial admission and the potential readmission by determining if any diagnosis overlapped between the two admissions. • Finally, a research inspected all matches to determine if the readmission was relevant.
Number of members who received restorative dental services per 1,000 members	Children age 0 - 20 years	A detailed list of current procedural terminology codes can be found in Table 52. Children who had obtained these services were included in the numerator. The denominator consisted of all children 0-20 years who were eligible to receive dental services.

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[11] Centers for Medicare and Medicaid Services Place of Service codes for Professional Claims. http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/Downloads/Website-POS-database.pdf

Performance Measure/Indicator	Measure Source	Measure development or adaptation from data source
Number of asthma hospital admissions per 100,000 members	HHSC	Numerator included clients with principal and/or top five diagnoses of asthma as specified in 2014 HEDIS® Technical specifications. Denominator included all hospitalizations for program and service delivery area.
Number of SPMI hospital admissions per 100,000 members	HHSC	HHSC defines SPMI as "schizophrenia, major depression, bipolar disorder or other severely disabling mental order" and "Children and adolescents ages 3 through 17 years with a diagnosis of a mental illness or who exhibit a serious emotional disturbance."

Table 42. STAR Population Hidalgo Service Delivery Area by Federal Fiscal Year

	Pre-Demonstration			Post-Demonstration			
	2009	2010	2011	2012	2013	2014	2015
Characteristic	Count	Count	Count	Count	Count	Count	Count
Member Months	3,675,856	3,974,133	4,207,165	4,291,126	4,269,705	4,349,399	4,584,983
Number of Medicaid Clients	405,495	426,321	447,481	450,975	446,636	460,999	471,959
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	53.6	53.5	53.7	53.8	54.0	55.2	53.9
Age (years)							
0-5	42.7	41.8	40.6	39.7	39.2	37.4	36.1
6-14	36.8	37.4	37.0	37.1	37.5	38.5	39.5
15-20	13.1	13.5	13.8	13.9	13.8	14.3	14.8
21-64	7.4	7.3	8.7	9.2	9.5	9.7	9.5
65 and older	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Race/Ethnicity							
White	1.4	1.5	1.5	1.6	1.8	2.0	2.2
Hispanic	97.7	97.2	95.6	93.4	92.1	91.3	90.4
African-American	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other	0.7	1.1	2.7	4.9	5.9	6.5	7.2
Program Category[2]							
Children	66.5	67.7	66.7	65.2	64.1	66.0	75.7
Infant	12.4	11.9	11.6	11.2	11.0	11.3	11.7
Pregnant	6.8	6.5	6.1	5.7	5.9	5.9	6.0
TANF[3]	11.9	12.0	13.9	16.3	16.7	14.6	4.8
Transitional	2.4	1.9	1.7	1.6	2.3	2.2	1.8
Length of enrollment[4]							
1–6 months	33.1	29.6	28.7	26.6	25.9	26.5	22.9
7–10 months	17.4	15.9	14.9	14.7	14.3	15.7	15.9
11–12 months	49.6	54.5	56.4	58.8	59.8	57.9	61.2

[1] The STAR study population collectively refers to the pre-Program STAR eligible clients and the post-Program STAR

[2] Medicaid Program Types (TP): Infants (TP43, TP 45), Children (TP44, TP47, TP48), TANF (TP01, TP61), Transitional (TP07, TP20, TP29, TP37); Pregnant Women (TP40)

[3] Temporary Assistance for Needy Families (TANF)

[4] Longest period single period of continuous enrollment during the measurement year

Table 43. STAR Population Central Medicaid Rural Service Area by Federal Fiscal Year

Characteristic	Pre-Demonstration			Post-Demonstration			
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
	Count	Count	Count	Count	Count	Count	Count
Member Months	1,233,924	1,397,560	1,472,650	1,479,213	1,462,244	1,522,274	1,689,837
Number of Medicaid Clients	147,439	160,142	167,005	168,862	167,075	176,460	186,054
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	56.2	56.3	56.2	56.2	56.2	56.0	55.7
Age (years)							
0-5	44.1	42.8	42.1	41.5	41.1	39.1	37.7
6-14	31.5	31.8	32.3	32.9	33.4	34.9	36.6
15-20	12.5	12.4	12.4	12.2	12.0	12.4	12.7
21-64	11.9	13.0	13.3	13.4	13.4	13.6	13.0
65 and older	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Race/Ethnicity							
White	35.1	34.0	32.6	31.6	30.6	30.0	29.2
Hispanic	35.5	35.0	35.2	34.9	34.8	35.1	35.1
African-American	24.2	22.9	21.6	20.9	20.7	20.2	19.7
Other	5.2	8.1	10.6	12.6	13.9	14.7	16.0
Program Category[2]							
Children	61.9	58.1	57.9	57.9	58.4	61.1	70.6
Infant	14.5	13.3	12.6	12.3	12.3	12.4	12.7
Pregnant	8.8	8.0	7.8	7.9	8.1	8.1	7.8
TANF[3]	12.9	18.5	18.6	18.8	17.8	15.6	6.5
Transitional	1.8	2.1	3.1	3.2	3.3	2.9	2.4
Length of enrollment[4]							
1–6 months	42.4	37.2	36.0	36.8	36.4	37.0	31.2
7–10 months	19.6	18.3	17.5	17.2	17.4	18.9	19.6
11–12 months	37.9	44.6	46.5	46.0	46.2	44.1	49.2

[1] The STAR study population collectively refers to the pre-Program STAR eligible clients and the post-Program STAR

[2] Medicaid Program Types (TP): Infants (TP43, TP 45), Children (TP44, TP47, TP48), TANF (TP01, TP61), Transitional

[3] Temporary Assistance for Needy Families (TANF)

[4] Longest period single period of continuous enrollment during the measurement year

Table 44. STAR Population Northeast Medicaid Rural Service Area by Federal Fiscal Year

Characteristic	Pre-Demonstration			Post-Demonstration			
	2009 Count	2010 Count	2011 Count	2012 Count	2013 Count	2014 Count	2015 Count
Member Months	1,573,227	1,782,767	1,933,661	1,961,325	1,946,742	1,985,531	2,160,672
Number of Medicaid Clients	186,642	203,468	219,014	221,984	218,579	227,214	236,622
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	55.6	55.1	55.6	55.8	55.8	55.6	55.4
Age (years)							
0-5	45.8	44.8	42.9	42.0	41.2	39.0	37.3
6-14	32.3	33.6	33.4	33.7	34.1	35.6	37.3
15-20	12.8	12.7	12.5	12.4	12.3	12.8	13.2
21-64	9.1	8.9	11.2	11.9	12.4	12.6	12.2
65 and older	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Race/Ethnicity							
White	50.5	50.1	48.2	45.8	44.3	43.3	42.6
Hispanic	23.6	24.5	24.2	24.3	24.4	24.7	24.9
African-American	24.0	22.8	21.6	20.8	20.4	19.9	19.1
Other	1.9	2.6	6.0	9.1	10.9	12.1	13.4
Program Category[2]							
Children	67.2	69.0	66.4	61.5	60.6	62.8	71.9
Infant	15.7	14.5	13.4	12.5	12.5	12.3	12.3
Pregnant	10.1	9.4	8.3	8.0	8.4	8.0	7.7
TANF[3]	5.6	6.0	10.7	16.1	16.2	14.5	6.2
Transitional	1.4	1.1	1.2	1.9	2.3	2.4	1.9
Length of enrollment[4]							
1–6 months	41.8	37.3	35.5	35.3	34.1	35.1	30.0
7–10 months	19.9	19.0	18.4	17.3	17.4	18.6	19.6
11–12 months	38.3	43.8	46.1	47.3	48.5	46.3	50.4

[1] The STAR study population collectively refers to the pre-Program STAR eligible clients and the post-Program STAR

[2] Medicaid Program Types (TP): Infants (TP43, TP 45), Children (TP44, TP47, TP48), TANF (TP01, TP61), Transitional

[3] Temporary Assistance for Needy Families (TANF)

[4] Longest period single period of continuous enrollment during the measurement year

Table 45. STAR Population West Medicaid Rural Service Area by Federal Fiscal Year

Characteristic	Pre-Demonstration			Post-Demonstration			
	2009 Count	**2010** Count	**2011** Count	**2012** Count	**2013** Count	**2014** Count	**2015** Count
Member Months	1,606,178	1,771,657	1,831,314	1,790,547	1,721,891	1,751,629	1,936,709
Number of Medicaid Clients	193,370	206,396	213,110	208,859	202,323	208,187	220,899
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	57.9	56.3	54.2	52.7	52.1	51.6	52.1
Age (years)							
0-5	46.7	44.7	41.4	39.4	38.3	36.2	35.2
6-14	32.6	33.2	32.0	31.2	30.8	31.8	34.0
15-20	13.9	13.6	12.8	12.1	11.7	11.7	12.3
21-64	10.4	10.0	11.1	11.5	11.7	12.0	11.8
65 and older	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Race/Ethnicity							
White	34.7	33.7	31.2	28.6	27.2	26.6	26.6
Hispanic	60.1	58.3	54.1	50.5	49.0	48.3	49.2
African-American	6.7	6.3	5.9	5.6	5.4	5.4	5.3
Other	2.1	3.2	6.2	9.3	10.9	11.3	12.3
Program Category[2]							
Children	67.3	67.6	63.0	56.7	54.9	56.0	65.2
Infant	16.5	14.9	13.2	12.4	12.6	12.4	12.6
Pregnant	11.5	10.1	8.9	8.7	9.0	8.6	8.3
TANF[3]	6.5	7.4	10.6	14.2	13.8	12.4	5.5
Transitional	1.9	1.5	1.6	2.1	2.3	2.2	1.7
Length of enrollment[4]							
1–6 months	45.2	39.6	37.5	36.5	36.2	36.0	31.8
7–10 months	20.8	19.8	18.4	17.3	17.1	18.3	19.6
11–12 months	37.6	42.0	41.4	40.3	39.3	37.3	41.9

[1] The STAR study population collectively refers to the pre-Program STAR eligible clients and the post-Program STAR
[2] Medicaid Program Types (TP): Infants (TP43, TP 45), Children (TP44, TP47, TP48), TANF (TP01, TP61), Transitional
[3] Temporary Assistance for Needy Families (TANF)
[4] Longest period single period of continuous enrollment during the measurement year

Table 46. STAR+PLUS Population El Paso Service Delivery Area by Federal Fiscal Year

Characteristic	Pre-Demonstration			Post-Demonstration			
	2009	2010	2011	2012	2013	2014	2015
	Count	Count	Count	Count	Count	Count	Count
Member Months	92,937	95,478	96,526	97,491	99,012	98,463	97,501
Number of Medicaid Clients	9,641	9,655	9,852	9,977	9,973	9,790	9,651
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	58.4	57.8	56.7	55.8	55.3	54.6	53.9
Age (years)							
21–44	36.0	36.5	36.9	37.9	38.8	40.2	41.0
45–64	64.0	63.5	63.1	61.7	60.5	59.3	58.4
65 and older	0.0	0.0	0.0	0.4	0.6	0.5	0.6
Race/Ethnicity							
White	18.2	17.3	17.7	14.3	16.1	15.0	12.5
Hispanic	73.7	73.6	69.8	61.9	59.4	59.7	66.7
African-American	3.6	3.4	3.3	3.4	3.1	2.8	2.7
Other	4.5	5.7	9.2	17.4	21.4	22.5	18.1
Program Category[2]							
Aged	0.0	0.0	0.0	0.4	0.7	0.5	0.6
Blind	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Disabled	98.9	98.9	98.9	98.5	98.3	98.4	98.4
Length of enrollment[3]							
1–6 months	22.0	20.0	19.7	21.3	19.9	17.8	17.5
7–10 months	9.3	9.4	9.8	8.7	8.9	8.9	8.3
11–12 months	68.7	70.7	70.4	70.1	71.2	73.4	74.1

[1] The STAR+PLUS study population collectively refers to the pre-Program STAR+PLUS eligible clients and the post-
[2] Medicaid Program Categories (CAT): Aged (CAT1), Blind (CAT3), and Disabled (CAT4)
[3] Longest period single period of continuous enrollment during the measurement year

Table 47. STAR+PLUS Population Hidalgo Service Delivery Area by Federal Fiscal Year

	Pre-Demonstration			Post-Demonstration			
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Characteristic	Count	Count	Count	Count	Count	Count	Count
Member Months	227,115	235,505	237,576	239,937	238,525	235,728	234,116
Number of Medicaid Clients	23,041	23,602	23,907	23,984	23,447	23,068	22,862
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	57.4	57.1	56.3	55.7	55.0	54.1	53.4
Age (years)							
21–44	36.3	37.4	38.8	39.5	40.5	42.3	44.1
45–64	63.7	62.6	61.2	60.0	59.0	57.2	55.1
65 and older	0.0	0.0	0.0	0.5	0.6	0.5	0.8
Race/Ethnicity							
White	15.4	14.4	14.8	15.9	14.7	13.3	10.4
Hispanic	80.5	81.3	78.9	68.9	67.2	67.9	75.5
African-American	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Other	3.7	3.9	5.9	14.8	17.8	18.5	13.8
Program Category[2]							
Aged	0.0	0.0	0.0	0.5	0.6	0.5	0.8
Blind	1.6	1.6	1.5	1.5	1.4	1.4	1.5
Disabled	98.4	98.4	98.5	98.1	98.0	98.1	97.8
Length of enrollment[3]							
1–6 months	19.8	18.5	18.2	18.0	16.8	15.7	15.7
7–10 months	9.1	9.6	9.1	8.8	8.2	7.8	7.7
11–12 months	71.0	71.9	72.7	73.2	75.0	76.5	76.6

[1] The STAR+PLUS study population collectively refers to the pre-Program STAR+PLUS eligible clients and the post-
[2] Medicaid Program Categories (CAT): Aged (CAT1), Blind (CAT3), and Disabled (CAT4)
[3] Longest period single period of continuous enrollment during the measurement year

Table 48. STAR+PLUS Population Lubbock Service Delivery Area by Federal Fiscal Year

	Pre-Demonstration			Post-Demonstration			
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Characteristic	Count	Count	Count	Count	Count	Count	Count
Member Months	68,900	70,959	72,469	75,713	76,314	77,098	77,403
Number of Medicaid Clients	7,424	7,565	7,742	8,035	7,860	7,907	7,855
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	55.9	55.2	53.9	53.3	53.2	52.7	52.8
Age (years)							
21–44	40.0	39.9	39.1	37.9	38.6	38.8	39.3
45–64	60.1	60.1	60.9	61.2	60.5	60.2	59.5
65 and older	0.0	0.0	0.0	0.9	0.9	1.0	1.2
Race/Ethnicity							
White	45.5	45.2	43.5	41.5	38.8	36.7	34.6
Hispanic	31.6	30.9	23.4	26.0	25.0	25.3	27.7
African-American	14.9	14.8	14.4	13.7	13.5	13.0	12.4
Other	8.0	9.2	12.7	18.9	22.6	25.0	25.2
Program Category[2]							
Aged	0.0	0.0	0.0	0.9	0.9	1.1	1.2
Blind	1.0	1.1	1.0	1.0	1.0	1.0	1.2
Disabled	99.0	98.9	99.0	98.1	98.1	98.0	97.7
Length of enrollment[3]							
1–6 months	24.7	23.6	21.9	21.8	20.0	17.9	17.4
7–10 months	9.0	8.8	9.2	9.8	8.8	9.7	8.9
11–12 months	66.3	67.6	68.9	68.3	71.2	72.4	73.7

[1] The STAR+PLUS study population collectively refers to the pre-Program STAR+PLUS eligible clients and the post-
[2] Medicaid Program Categories (CAT): Aged (CAT1), Blind (CAT3), and Disabled (CAT4)
[3] Longest period single period of continuous enrollment during the measurement year

Table 49. STAR+PLUS Population Central Medicaid Rural Service Area by Federal Fiscal Year

	Pre-Demonstration			Post-Demonstration			
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Characteristic	Count	Count	Count	Count	Count	Count	Count
Member Months	130,289	139,486	147,392	156,596	158,431	160,385	163,722
Number of Medicaid Clients	14,282	15,102	15,908	16,694	16,442	16,662	16,873
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	56.3	55.5	54.9	53.6	53.4	52.8	52.4
Age (years)							
21–44	44.6	44.7	44.8	43.9	44.6	45.0	45.2
45–64	55.4	55.3	55.2	56.1	55.3	54.8	54.0
65 and older	0.0	0.0	0.0	0.0	0.2	0.3	0.8
Race/Ethnicity							
White	47.8	46.8	45.5	43.6	41.3	38.7	35.7
Hispanic	12.7	12.9	12.3	11.2	10.6	10.5	12.1
African-American	31.3	30.8	29.4	27.9	26.6	25.4	23.8
Other	8.2	9.6	12.9	17.3	21.5	25.4	28.4
Program Category[2]							
Aged	0.0	0.0	0.0	0.0	0.2	0.3	0.8
Blind	0.8	0.9	0.8	0.9	0.9	0.9	0.8
Disabled	99.2	99.1	99.2	99.1	99.0	98.9	98.4
Length of enrollment[3]							
1–6 months	23.7	22.6	21.1	19.7	18.9	16.8	17.0
7–10 months	9.7	9.5	9.6	9.4	8.5	8.8	8.5
11–12 months	66.7	67.9	69.4	70.8	72.6	74.7	74.5

[1] The STAR+PLUS study population collectively refers to the pre-Program STAR+PLUS eligible clients and the post-
[2] Medicaid Program Categories (CAT): Aged (CAT1), Blind (CAT3), and Disabled (CAT4)
[3] Longest period single period of continuous enrollment during the measurement year

Table 50. STAR+PLUS Population Northeast Medicaid Rural Service Area by Federal Fiscal Year

	Pre-Demonstration			Post-Demonstration			
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Characteristic	Count	Count	Count	Count	Count	Count	Count
Member Months	230,017	240,390	246,053	250,524	254,096	257,976	261,479
Number of Medicaid Clients	24,464	25,236	25,575	26,237	25,889	26,401	26,545
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	55.9	55.0	54.3	53.6	53.1	52.6	52.2
Age (years)							
21–44	41.5	41.7	41.4	40.7	40.4	40.6	40.6
45–64	58.5	58.3	58.6	59.3	59.4	59.1	58.9
65 and older	0.0	0.0	0.0	0.0	0.2	0.3	0.5
Race/Ethnicity							
White	59.0	58.6	56.4	53.0	50.7	47.8	44.9
Hispanic	3.0	3.1	3.1	2.9	2.8	3.1	3.5
African-American	30.8	30.6	29.5	28.1	26.8	25.0	23.6
Other	7.2	7.7	11.0	16.0	19.8	24.1	28.1
Program Category[2]							
Aged	0.0	0.0	0.0	0.0	0.2	0.3	0.5
Blind	0.8	0.8	0.8	0.8	0.8	0.9	0.8
Disabled	99.2	99.2	99.2	99.2	99.0	98.9	98.7
Length of enrollment[3]							
1–6 months	22.6	21.2	19.7	19.6	18.4	16.7	17.2
7–10 months	9.3	9.4	9.1	8.1	8.4	9.1	7.9
11–12 months	68.1	69.4	71.2	72.3	73.3	74.2	74.9

[1] The STAR+PLUS study population collectively refers to the pre-Program STAR+PLUS eligible clients and the post-
[2] Medicaid Program Categories (CAT): Aged (CAT1), Blind (CAT3), and Disabled (CAT4)
[3] Longest period single period of continuous enrollment during the measurement year

Table 51. STAR+PLUS Population West Medicaid Rural Service Area by Federal Fiscal Year

Characteristic	Pre-Demonstration			Post-Demonstration			
	2009 Count	2010 Count	2011 Count	2012 Count	2013 Count	2014 Count	2015 Count
Member Months	177,395	183,740	185,046	187,286	189,276	188,890	188,548
Number of Medicaid Clients	18,866	19,446	19,461	20,503	19,898	20,107	19,804
Gender	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Female	57.1	56.8	55.9	54.7	54.5	54.0	52.9
Age (years)							
21–44	39.2	39.6	39.2	39.4	39.1	39.7	40.1
45–64	60.8	60.4	6079.0	60.6	60.6	59.8	59.0
65 and older	0.0	0.0	0.0	0.0	0.3	0.5	0.9
Race/Ethnicity							
White	52.0	51.5	50.3	47.5	45.3	42.4	69.6
Hispanic	31.3	31.2	30.2	25.8	24.5	24.7	27.3
African-American	9.3	9.4	9.0	9.2	8.4	8.2	7.6
Other	7.3	8.0	10.6	17.6	21.9	24.8	25.5
Program Category[2]							
Aged	0.0	0.0	0.0	0.0	0.3	0.5	0.8
Blind	1.0	0.9	0.9	0.9	0.9	0.9	1.0
Disabled	99.0	99.1	99.1	99.1	98.8	98.6	98.2
Length of enrollment[3]							
1–6 months	22.4	21.3	20.7	21.2	20.9	19.0	19.4
7–10 months	9.5	9.5	9.1	8.7	9.1	10.2	9.2
11–12 months	68.2	69.2	70.2	70.2	70.0	70.8	71.4

[1] The STAR+PLUS study population collectively refers to the pre-Program STAR+PLUS eligible clients and the post-
[2] Medicaid Program Categories (CAT): Aged (CAT1), Blind (CAT3), and Disabled (CAT4)
[3] Longest period single period of continuous enrollment during the measurement year

Table 52. Dental Performance Indicator, Data Source, and Current Procedural Terminology codes

Performance Measure/Indicator	Data Source	CPT code(s)
Diagnostic dental procedure codes	2014 TMHP Provider Manual	'D9000' 'D0110' 'D0120' 'D0130' 'D0140' 'D0145' 'D0150' 'D0160' 'D0170' 'D0180' 'D0210' 'D0220' 'D0230' 'D0240' 'D0250' 'D0260' 'D0270' 'D0272' 'D0273' 'D0274' 'D0275' 'D0277' 'D0290' 'D0310' 'D0320' 'D0321' 'D0322' 'D0330' 'D0340' 'D0350' 'D0367' 'D0410' 'D0415' 'D0416' 'D0420' 'D0421' 'D0425' 'D0431' 'D0460' 'D0470' 'D0471' 'D0472' 'D0473' 'D0474' 'D0475' 'D0476' 'D0477' 'D0478' 'D0479' 'D0480' 'D0481' 'D0482' 'D0483' 'D0484' 'D0485' 'D0501' 'D0502' 'D0999'
Preventive dental procedure codes	2014 TMHP Provider Manual	'D1019' 'D1110' 'D1120' 'D1201' 'D1202' 'D1203' 'D1204' 'D1205' 'D1206' 'D1208' 'D1310' 'D1320' 'D1330' 'D1351' 'D1352' 'D1510' 'D1515' 'D1520' 'D1525' 'D1550' 'D1555'
Restorative dental procedure codes	2014 TMHP Provider Manual	'D2110' 'D2120' 'D2130' 'D2131' 'D2140' 'D2150' 'D2160' 'D2161' 'D2210' 'D2310' 'D2330' 'D2331' 'D2332' 'D2335' 'D2336' 'D2337' 'D2380' 'D2381' 'D2382' 'D2385' 'D2386' 'D2387' 'D2388' 'D2390' 'D2391' 'D2392' 'D2393' 'D2394' 'D2410' 'D2420' 'D2430' 'D2510' 'D2520' 'D2530' 'D2540' 'D2542' 'D2543' 'D2544' 'D2610' 'D2620' 'D2630' 'D2640' 'D2642' 'D2643' 'D2644' 'D2650' 'D2651' 'D2652' 'D2660' 'D2662' 'D2663' 'D2664' 'D2710' 'D2712' 'D2720' 'D2721' 'D2722' 'D2740' 'D2750' 'D2751' 'D2752' 'D2780' 'D2781' 'D2782' 'D2783' 'D2790' 'D2791' 'D2792' 'D2794' 'D2799' 'D2810' 'D2910' 'D2915' 'D2920' 'D2930' 'D2931' 'D2932' 'D2933' 'D2934' 'D2940' 'D2950' 'D2951' 'D2952' 'D2953' 'D2954' 'D2955' 'D2957' 'D2960' 'D2961' 'D2962' 'D2970' 'D2971' 'D2975' 'D2980' 'D2999'
Orthodontics dental procedure codes	2014 TMHP Provider Manual	'D8010' 'D8020' 'D8030' 'D8040' 'D8050' 'D8060' 'D8070' 'D8080' 'D8090' 'D8110' 'D8120' 'D8210' 'D8220' 'D8360' 'D8370' 'D8460' 'D8470' 'D8480' 'D8560' 'D8570' 'D8580' 'D8650' 'D8660' 'D8670' 'D8680' 'D8690' 'D8691' 'D8692' 'D8693' 'D8750' 'D8999'
All other services (includes endodontics, periodontics, prosthetics, implants, and oral surgery)	2014 TMHP Provider Manual	'D3110' 'D3120' 'D3220' 'D3221' 'D3230' 'D3240' 'D3310' 'D3320' 'D3330' 'D3331' 'D3332' 'D3333' 'D3340' 'D3346' 'D3347' 'D3348' 'D3350' 'D3351' 'D3352' 'D3353' 'D3410' 'D3411' 'D3420' 'D3421' 'D3425' 'D3426' 'D3430' 'D3440' 'D3450' 'D3460' 'D3470' 'D3910' 'D3920' 'D3940' 'D3950' 'D3960' 'D3999' 'D4210' 'D4211' 'D4220' 'D4230' 'D4231' 'D4240' 'D4241' 'D4245' 'D4249' 'D4250' 'D4260' 'D4261' 'D4262' 'D4263' 'D4264' 'D4265' 'D4266' 'D4267' 'D4268' 'D4270' 'D4271' 'D4272' 'D4273' 'D4274' 'D4275' 'D4276' 'D4277' 'D4278' 'D4320' 'D4321' 'D4340' 'D4341' 'D4342' 'D4345' 'D4350' 'D4355' 'D4381' 'D4910' 'D4920' 'D4999' 'D5110' 'D5120' 'D5130' 'D5140' 'D5211' 'D5212' 'D5213' 'D5214' 'D5215' 'D5216' 'D5225' 'D5226' 'D5280' 'D5281' 'D5410' 'D5411' 'D5421' 'D5422' 'D5510' 'D5520' 'D5610' 'D5620' 'D5630' 'D5640' 'D5650' 'D5660' 'D5670' 'D5671' 'D5710' 'D5711' 'D5720' 'D5721' 'D5730' 'D5731' 'D5740' 'D5741' 'D5750' 'D5751' 'D5760' 'D5761' 'D5810' 'D5811' 'D5820' 'D5821' 'D5850' 'D5851' 'D5860' 'D5861' 'D5862' 'D5867' 'D5875' 'D5899' 'D5910' 'D5911' 'D5912' 'D5913' 'D5914' 'D5915' 'D5916' 'D5917' 'D5918' 'D5919' 'D5920' 'D5921' 'D5922' 'D5923' 'D5924' 'D5925' 'D5926' 'D5927' 'D5928' 'D5929' 'D5931' 'D5932' 'D5933' 'D5934' 'D5935' 'D5936' 'D5937' 'D5951' 'D5952' 'D5953' 'D5954' 'D5955' 'D5956' 'D5957' 'D5958' 'D5959' 'D5960' 'D5971' 'D5972' 'D5973' 'D5974' 'D5976' 'D5982' 'D5983' 'D5984' 'D5985' 'D5986' 'D5987' 'D5988' 'D5999' 'D6010' 'D6020' 'D6030' 'D6040' 'D6050' 'D6053' 'D6054' 'D6055' 'D6056' 'D6057' 'D6058' 'D6059' 'D6060' 'D6061' 'D6062' 'D6063' 'D6064' 'D6065' 'D6066' 'D6067' 'D6068' 'D6069' 'D6070' 'D6071' 'D6072' 'D6073' 'D6074' 'D6075' 'D6076' 'D6077' 'D6078' 'D6079' 'D6080' 'D6090' 'D6094' 'D6095' 'D6100' 'D6190' 'D6194' 'D6199' 'D6205' 'D6210' 'D6211' 'D6212' 'D6214' 'D6240' 'D6241' 'D6242' 'D6245' 'D6250' 'D6251' 'D6252' 'D6253' 'D6519' 'D6520' 'D6530' 'D6540' 'D6543' 'D6544' 'D6545' 'D6548' 'D6600' 'D6601' 'D6602' 'D6603' 'D6604' 'D6605' 'D6606' 'D6607' 'D6608' 'D6609' 'D6610' 'D6611' 'D6612' 'D6613' 'D6614' 'D6615' 'D6624' 'D6634' 'D6710' 'D6720' 'D6721' 'D6722' 'D6740' 'D6750' 'D6751'

| | | 'D6752' 'D6780' 'D6781' 'D6782' 'D6783' 'D6790' 'D6791' 'D6792' 'D6793' 'D6794' 'D6920' 'D6930' 'D6940' 'D6950' 'D6970' 'D6971' 'D6972' 'D6973' 'D6975' 'D6976' 'D6977' 'D6980' 'D6985' 'D6999' 'D7110' 'D7111' 'D7120' 'D7130' 'D7140' 'D7210' 'D7220' 'D7230' 'D7240' 'D7241' 'D7250' 'D7260' 'D7261' 'D7270' 'D7271' 'D7272' 'D7280' 'D7281' 'D7282' 'D7283' 'D7285' 'D7286' 'D7287' 'D7288' 'D7290' 'D7291' 'D7310' 'D7311' 'D7320' 'D7321' 'D7340' 'D7350' 'D7410' 'D7411' 'D7412' 'D7413' 'D7414' 'D7415' 'D7420' 'D7430' 'D7431' 'D7440' 'D7441' 'D7450' 'D7451' 'D7460' 'D7461' 'D7465' 'D7470' 'D7471' 'D7472' 'D7473' 'D7480' 'D7485' 'D7490' 'D7510' 'D7511' 'D7520' 'D7521' 'D7530' 'D7540' 'D7550' 'D7560' 'D7610' 'D7620' 'D7630' 'D7640' 'D7650' 'D7660' 'D7670' 'D7671' 'D7680' 'D7710' 'D7720' 'D7730' 'D7740' 'D7750' 'D7760' 'D7770' 'D7771' 'D7780' 'D7810' 'D7820' 'D7830' 'D7840' 'D7850' 'D7852' 'D7854' 'D7856' 'D7858' 'D7860' 'D7865' 'D7870' 'D7871' 'D7872' 'D7873' 'D7874' 'D7875' 'D7876' 'D7877' 'D7880' 'D7899' 'D7910' 'D7911' 'D7912' 'D7920' 'D7940' 'D7941' 'D7942' 'D7943' 'D7944' 'D7945' 'D7946' 'D7947' 'D7948' 'D7949' 'D7950' 'D7953' 'D7955' 'D7960' 'D7963' 'D7970' 'D7971' 'D7972' 'D7980' 'D7981' 'D7982' 'D7983' 'D7990' 'D7991' 'D7992' 'D7993' 'D7994' 'D7995' 'D7996' 'D7997' 'D7999' 'D9110' 'D9120' 'D9210' 'D9211' 'D9212' 'D9215' 'D9220' 'D9221' 'D9230' 'D9240' 'D9241' 'D9242' 'D9248' 'D924X' 'D9310' 'D9410' 'D9420' 'D9430' 'D9440' 'D9450' 'D9610' 'D9612' 'D9630' 'D9910' 'D9911' 'D9920' 'D9930' 'D9940' 'D9941' 'D9942' 'D9950' 'D9951' 'D9952' 'D9960' 'D9970' 'D9971' 'D9972' 'D9973' 'D9974' 'D9999' |

Table 53. Ambulatory Care Sensitive Conditions ICD-9 Codes

Condition	ICD-9-CM code(s)	ACSC Condition	Exclusions/Comments
Angina	411.1	Intermediate Coronary Syndrome (Angina)	Similar to AHRQ PQI measure #13, excludes cases with cardiac procedure codes
	411.8X	Acute coronary occlusion without myocardial infarction and other forms of ischemic heart disease	
	413.X	Angina decubitus, prinzmetal angina, angina pectoris NEC/NOS	
Appendicitis	540.X	Acute appendicitis	Similar to AHRQ PQI measure #2
	541	Appendicitis, not otherwise specified	
Asthma	493.XX	Extrinsic asthma, Intrinsic asthma, chronic obstructive asthma, asthma unspecified	Includes part of AHRQ PQI measure #5, excludes cases with cystic fibrosis and anomalies of respiratory system
Bacterial Pneumonia	481	Pneumococcal pneumonia (streptococcus pneumoniae pneumonia)	Similar to AHRQ PQI measure #11, exclude cases with immunocompromised state diagnoses and secondary diagnosis of sickle cell [282.4 or 282.6]
	482.2	Pneumonia due to Hemophilus influenza (H. influenza)	
	482.3X	Pneumonia due to Streptococcus	
	482.4X	Pneumonia due to Staphylococcus	
	482.9	Bacterial pneumonia unspecified	
	483.X	Pneumonia due to other specified organism	
	485	Bronchopneumonia, organism unspecified	
	486	Pneumonia organism, unspecified	
Bronchitis	466.0	Acute bronchitis	Includes part of AHRQ PQI measure #5, excludes cases with cystic fibrosis and anomalies of respiratory system
	490	Bronchitis, not specified as acute or chronic	
	491.X	Bronchitis, chronic	
	492.X	Emphysema	
	494.X	Bronchiectasis	
	496.X	Chronic airway obstruction	
Cellulitis	681.XX	Cellulitis and abscess of finger and toe	Exclude cases with surgical procedure for inpatient hospital episodes [01-86.99], except incision of skin and
	682.X	Other cellulitis and abscess	

Condition	ICD-9-CM code(s)	ACSC Condition	Exclusions/Comments
	683	Acute lymphadenitis	subcutaneous tissue [86.0] where it is the only listed surgical procedure
	686.X	Other local infections of skin and subcutaneous tissue	
Common Cold	460	Acute nasopharyngitis	
Congestive Heart Failure	398.91	Rheumatic heart failure	Similar to AHRQ PQI measure #8, excluding cardiac procedure
	402.01	Hypertensive heart disease with heart failure, malignant	
	402.11	Hypertensive heart disease with heart failure, benign	
	402.91	Hypertensive heart disease with heart failure, unspecified	
	404.01	Hypertensive heart and chronic kidney disease (Stage I - Stage IV), malignant	
	404.03	Hypertensive heart and chronic kidney disease (Stage V), malignant	
	404.11	Hypertensive heart and chronic kidney disease (Stage I - Stage IV), benign	
	404.13	Hypertensive heart and chronic kidney disease (Stage V), benign	
	404.91	Hypertensive heart and chronic kidney disease (Stage I - Stage IV), unspecified	
	404.93	Hypertensive heart and chronic kidney disease (Stage V), unspecified	
	428.XX	Heart failure, unspecified	
Diabetes	250.X	Diabetes	Includes AHRQ PQI#1, PQI#3, and PQI#14
Dehydration	008.6X	Enteritis	Includes AHRQ PQI#10 and excluding chronic renal failure diagnosis codes
	008.8X	Intestinal infection due to other organism not elsewhere classified	
	009.X	Infectious diarrhea	
	276.0	Hyperosmolality and/or hypernatremia	
	276.5X	Dehydration - Volume depletion	
Epilepsy	345.X	Epilepsy	
Gangrene	785.4	Gangrene	
Gastroenteritis	558.X	Gastroenteritis	Includes part of AHRQ PQI#10, excluding chronic renal failure diagnosis codes

Condition	ICD-9-CM code(s)	ACSC Condition	Exclusions/Comments
Hypertensive Disease	401.0	Malignant essential hypertension	Similar to AHRQ PQI measure #7, excluding kidney disease diagnoses codes and dialysis access procedure codes
	401.9	Essential hypertension, unspecified	
	402.00	Hypertensive heart disease, chronic heart failure	
	402.10	Benign with heart disease	
	402.90	Unspecified without heart disease	
	403.00	Hypertensive chronic kidney disease, malignant	
	403.10	Hypertensive chronic kidney disease, benign	
	403.90	Hypertensive chronic kidney disease, unspecified	
	404.00	Hypertensive heart and chronic kidney disease, malignant, without heart failure	
	404.10	Hypertensive heart and chronic kidney disease, benign, without heart failure	
	404.90	Hypertensive heart and chronic kidney disease, unspecified, without heart failure	
Hypoglycemia	251.2	Hypoglycemia, unspecified	
Hypokalemia	276.8	Hypokalemia, hypopotassemia	
Immunization-related and preventable conditions	032.X	Diphtheria	
	033.X	Whooping cough	
	037	Tetanus	
	045.X	Acute poliomyelitis	
	050.X	Smallpox	
	052.X	Chickenpox	
	055.X	Measles	
	070.XX	Viral Hepatitis	
	072.XX	Mumps	
	320.0	Hemophilus meningitis, bacterial meningitis	
	390	Rheumatic fever without mention of heart involvement	
	391.X	Rheumatic fever with mention of heart involvement	

Condition	ICD-9-CM code(s)	ACSC Condition	Exclusions/Comments
Nausea and Vomiting	787.01	Nausea with vomiting	
	787.02	Nausea alone	
	787.03	Vomiting alone	
Tuberculosis	012.X	Other respiratory tuberculosis	
	013.X	Tuberculosis of the meninges and central nervous system	
	014.X	Tuberculosis of intestines, peritoneum and mesenteric glands	
	015.X	Tuberculosis of bones and joints	
	016.X	Tuberculosis of genitourinary system	
	017.X	Tuberculosis of the other organs	
	018.X	Miliary tuberculosis	
Otitis Media, Acute	382.X	Suppurative and unspecified otitis media	
Pelvic Inflammatory Disease	614.X	Pelvic inflammatory disease	
Perforated Ulcer	531.1X	Gastric ulcer, acute with perforation	
	531.5	Gastric ulcer, chronic or unspecified with perforation	
	531.6	Gastric ulcer, chronic or unspecified with hemorrhage and perforation	
	532.1	Duodenal ulcer, acute with perforation	
	532.2	Duodenal ulcer, acute with hemorrhage and perforation	
	532.5	Duodenal ulcer, chronic or unspecified with perforation	
	532.6	Duodenal ulcer, chronic or unspecified with hemorrhage and perforation	
	533.1	Peptic ulcer, acute with perforation	
	533.2	Peptic ulcer, acute with hemorrhage and perforation	
Urinary Tract Infection	590.10	Acute pyelonephritis without lesion of renal medullary necrosis	Similar to AHRQ PQI measure #12, excluding kidney/urinary tract disorder diagnoses codes and immunocompromised state diagnoses
	590.11	Acute pyelonephritis with lesion of renal medullary necrosis	
	590.2	Renal/Perinephric abscess	
	590.3	Pyeloureteritis cystica	

Condition	ICD-9-CM code(s)	ACSC Condition	Exclusions/Comments
	590.8X	Pyelonephritis	
	590.9X	Kidney infection	
	595.0	Acute cystitis	
	595.9	Cystitis, unspecified	
	599.0	Urinary tract infection, unspecified	

Table 54. Top Ten Diagnosis for STAR+PLUS Inpatient Hospitalizations by Federal Fiscal Year: El Paso Service Delivery Area

	Federal Fiscal Year						
	2009	2010	2011	2012	2013	2014	2015
Diagnosis 1 (most frequent)	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Schizophrenic disorders	Schizophrenic disorders	Schizophrenic disorders
Diagnosis 2	General Symptoms	General Symptoms	General Symptoms	General Symptoms	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders
Diagnosis 3	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Symptoms involving respiratory system & other chest symptoms	Drug psychoses	Septicemia
Diagnosis 4	Symptoms involving digestive system	Symptoms involving digestive system	Symptoms involving digestive system	Diabetes mellitus	Diabetes mellitus	Symptoms involving respiratory system & other chest symptoms	Drug psychoses
Diagnosis 5	Gastrointestinal hemorrhage	Other cellulitis/abscess	Other cellulitis/abscess	Other cellulitis/abscess	Septicemia	Septicemia	Symptoms involving respiratory system & other chest symptoms
Diagnosis 6	Other cellulitis/abscess	Other disorders of soft tissues	Other disorders of soft tissues	Schizophrenic disorders	General Symptoms	Diabetes mellitus	Other cellulitis/abscess
Diagnosis 7	Pneumonia, organism unspecified	Disorders of fluid, electrolyte, & acid-base imbalance	Gastrointestinal hemorrhage	Pneumonia, organism unspecified	Other cellulitis/abscess	Pneumonia, organism unspecified	Symptoms involving abdomen/pelvis
Diagnosis 8	Other disorders of soft tissues	Gastrointestinal hemorrhage	Pneumonia, organism unspecified	Symptoms involving digestive system	Symptoms involving abdomen/pelvis	Other cellulitis/abscess	Diabetes mellitus
Diagnosis 9	Disorders of fluid, electrolyte, & acid-base imbalance	Pneumonia, organism unspecified	Osteoarthrosis and allied disorders	Other disorders of urethra and urinary tract	Osteoarthrosis and allied disorders	Symptoms involving abdomen/pelvis	Complications peculiar to certain specified procedures
Diagnosis 10	Symptoms involving head and neck	Osteoarthrosis and allied disorders	Diabetes mellitus	Episodic mood disorders	Pneumonia, organism unspecified	Complications peculiar to certain specified procedures	Disorders of fluid, electrolyte, & acid-base imbalance

Table 55. Top Ten Diagnosis for STAR+PLUS Inpatient Hospitalizations by Federal Fiscal Year: Hidalgo Service Delivery Area

	Federal Fiscal Year						
	2009	2010	2011	2012	2013	2014	2015
Diagnosis 1 (most frequent)	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders
Diagnosis 2	General Symptoms	General Symptoms	General Symptoms	Symptoms involving respiratory system & other chest symptoms	Septicemia	Schizophrenic disorders	Septicemia
Diagnosis 3	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Episodic mood disorders	Schizophrenic disorders	Schizophrenic disorders	Septicemia	Schizophrenic disorders
Diagnosis 4	Episodic mood disorders	Episodic mood disorders	Symptoms involving abdomen/pelvis	General Symptoms	Heart Failure	Diabetes mellitus	Diabetes mellitus
Diagnosis 5	Schizophrenic disorders	Schizophrenic disorders	Schizophrenic disorders	Symptoms involving abdomen/pelvis	Diabetes mellitus	Other cellulitis/abscess	Symptoms involving respiratory system & other chest symptoms
Diagnosis 6	Other cellulitis/abscess	Other cellulitis/abscess	Other cellulitis/abscess	Septicemia	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Heart Failure
Diagnosis 7	Symptoms involving digestive system	Symptoms involving digestive system	Symptoms involving digestive system	Other cellulitis/abscess	General Symptoms	General Symptoms	Other cellulitis/abscess
Diagnosis 8	Diabetes mellitus	Diabetes mellitus	Gastrointestinal hemorrhage	Diabetes mellitus	Other cellulitis/abscess	Heart Failure	Complications peculiar to certain specified procedures
Diagnosis 9	Other disorders of soft tissues	Disorders of fluid, electrolyte, & acid-base imbalance	Disorders of fluid, electrolyte, & acid-base imbalance	Heart Failure	Pneumonia, organism unspecified	Disorders of fluid, electrolyte, & acid-base imbalance	Pneumonia, organism unspecified
Diagnosis 10	Disorders of fluid, electrolyte, & acid-base imbalance	Pneumonia, organism unspecified	Other disorders of soft tissues	Disorders of fluid, electrolyte, & acid-base imbalance	Symptoms involving abdomen/pelvis	Pneumonia, organism unspecified	Symptoms involving abdomen/pelvis

Table 56. Top Ten Diagnosis for STAR+PLUS Inpatient Hospitalizations by Federal Fiscal Year: Lubbock Service Delivery Area

	Federal Fiscal Year						
	2009	2010	2011	2012	2013	2014	2015
Diagnosis 1 (most frequent)	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	General Symptoms	General Symptoms	Symptoms involving respiratory system & other chest symptoms
Diagnosis 2	General Symptoms	General Symptoms	General Symptoms	General Symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	General Symptoms
Diagnosis 3	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Episodic mood disorders	Symptoms involving abdomen/pelvis	Schizophrenic disorders	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis
Diagnosis 4	Other cellulitis/abscess	Episodic mood disorders	Symptoms involving abdomen/pelvis	Schizophrenic disorders	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders
Diagnosis 5	Episodic mood disorders	Other cellulitis/abscess	Schizophrenic disorders	Episodic mood disorders	Symptoms involving abdomen/pelvis	Septicemia	Septicemia
Diagnosis 6	Pneumonia, organism unspecified	Schizophrenic disorders	Other psychosocial circumstances	Pneumonia, organism unspecified	Other cellulitis/abscess	Schizophrenic disorders	Schizophrenic disorders
Diagnosis 7	Symptoms involving digestive system	Pneumonia, organism unspecified	Other cellulitis/abscess	Diabetes mellitus	Septicemia	Symptoms involving digestive system	Symptoms involving digestive system
Diagnosis 8	Diabetes mellitus	Symptoms involving digestive system	Diabetes mellitus	Gastrointestinal hemorrhage	Gastrointestinal hemorrhage	Pneumonia, organism unspecified	Other diseases of lung
Diagnosis 9	Schizophrenic disorders	Disorders of fluid, electrolyte, & acid-base imbalance	Pneumonia, organism unspecified	Septicemia	Pneumonia, organism unspecified	Gastrointestinal hemorrhage	Liver abscess and sequelae of chronic liver disease
Diagnosis 10	Heart Failure	Diabetes mellitus	Symptoms involving digestive system	Symptoms involving digestive system	Diabetes mellitus	Other diseases of lung	Gastrointestinal hemorrhage

Table 57. Top Ten Diagnosis for STAR+PLUS Inpatient Hospitalizations by Federal Fiscal Year: Central Medicaid Rural Service Delivery Area

	Federal Fiscal Year						
	2009	2010	2011	2012	2013	2014	2015
Diagnosis 1 (most frequent)	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Schizophrenic disorders	Schizophrenic disorders	Schizophrenic disorders
Diagnosis 2	General Symptoms	General Symptoms	General Symptoms	General Symptoms	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders
Diagnosis 3	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Schizophrenic disorders	Schizophrenic disorders	Septicemia	Septicemia	Septicemia
Diagnosis 4	Pneumonia, organism unspecified	Schizophrenic disorders	Symptoms involving abdomen/pelvis	Diabetes mellitus	Diabetes mellitus	Symptoms involving respiratory system & other chest symptoms	Diabetes mellitus
Diagnosis 5	Schizophrenic disorders	Symptoms involving digestive system	Symptoms involving digestive system	Septicemia	Symptoms involving respiratory system & other chest symptoms	Diabetes mellitus	Heart Failure
Diagnosis 6	Chronic bronchitis	Pneumonia, organism unspecified	Episodic mood disorders	Episodic mood disorders	Heart Failure	Heart Failure	Symptoms involving respiratory system & other chest symptoms
Diagnosis 7	Symptoms involving digestive system	Chronic bronchitis	Pneumonia, organism unspecified	Pneumonia, organism unspecified	Other diseases of lung	Other diseases of lung	Other diseases of lung
Diagnosis 8	Other cellulitis/abscess	Other cellulitis/abscess	Other cellulitis/abscess	Chronic bronchitis	Chronic bronchitis	General Symptoms	Chronic bronchitis
Diagnosis 9	Episodic mood disorders	Gastrointestinal hemorrhage	Diabetes mellitus	Other cellulitis/abscess	General Symptoms	Chronic bronchitis	Acute renal failure
Diagnosis 10	Diabetes mellitus	Episodic mood disorders	Chronic bronchitis	Heart Failure	Pneumonia, organism unspecified	Other cellulitis/abscess	Other cellulitis/abscess

Table 58. Top Ten Diagnosis for STAR+PLUS Inpatient Hospitalizations by Federal Fiscal Year: Northeast Medicaid Rural Service Delivery Area

	Federal Fiscal Year						
	2009	2010	2011	2012	2013	2014	2015
Diagnosis 1 (most frequent)	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders
Diagnosis 2	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders	Episodic mood disorders	Schizophrenic disorders	Schizophrenic disorders	Septicemia
Diagnosis 3	General Symptoms	General Symptoms	General Symptoms	Schizophrenic disorders	Septicemia	Septicemia	Schizophrenic disorders
Diagnosis 4	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Schizophrenic disorders	General Symptoms	Symptoms involving respiratory system & other chest symptoms	Diabetes mellitus	Diabetes mellitus
Diagnosis 5	Schizophrenic disorders	Schizophrenic disorders	Symptoms involving abdomen/pelvis	Chronic bronchitis	Pneumonia, organism unspecified	Heart Failure	Heart Failure
Diagnosis 6	Symptoms involving digestive system	Symptoms involving digestive system	Chronic bronchitis	Pneumonia, organism unspecified	Diabetes mellitus	Chronic bronchitis	Chronic bronchitis
Diagnosis 7	Pneumonia, organism unspecified	Chronic bronchitis	Pneumonia, organism unspecified	Diabetes mellitus	Chronic bronchitis	Pneumonia, organism unspecified	Symptoms involving respiratory system & other chest symptoms
Diagnosis 8	Chronic bronchitis	Pneumonia, organism unspecified	Symptoms involving digestive system	Symptoms involving abdomen/pelvis	Heart Failure	Symptoms involving respiratory system & other chest symptoms	Pneumonia, organism unspecified
Diagnosis 9	Other cellulitis/abscess	Other cellulitis/abscess	Other cellulitis/abscess	Other cellulitis/abscess	Other diseases of lung	Other diseases of lung	Other diseases of lung
Diagnosis 10	Heart Failure	Diabetes mellitus	Diabetes mellitus	Septicemia	General Symptoms	Other cellulitis/abscess	Acute renal failure

Table 59. Top Ten Diagnosis for STAR+PLUS Inpatient Hospitalizations by Federal Fiscal Year: West Medicaid Rural Service Delivery Area

	Federal Fiscal Year						
	2009	2010	2011	2012	2013	2014	2015
Diagnosis 1 (most frequent)	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Schizophrenic disorders	Septicemia	Episodic mood disorders
Diagnosis 2	General Symptoms	General Symptoms	General Symptoms	General Symptoms	Septicemia	Schizophrenic disorders	Schizophrenic disorders
Diagnosis 3	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Symptoms involving abdomen/pelvis	Episodic mood disorders	Diabetes mellitus	Episodic mood disorders	Septicemia
Diagnosis 4	Pneumonia, organism unspecified	Pneumonia, organism unspecified	Other cellulitis/abscess	Symptoms involving abdomen/pelvis	Episodic mood disorders	Diabetes mellitus	Diabetes mellitus
Diagnosis 5	Other cellulitis/abscess	Heart Failure	Heart Failure	Other cellulitis/abscess	Symptoms involving respiratory system & other chest symptoms	Symptoms involving respiratory system & other chest symptoms	Heart Failure
Diagnosis 6	Heart Failure	Other cellulitis/abscess	Symptoms involving digestive system	Pneumonia, organism unspecified	Chronic bronchitis	Pneumonia, organism unspecified	Chronic bronchitis
Diagnosis 7	Chronic bronchitis	Chronic bronchitis	Gastrointestinal hemorrhage	Diabetes mellitus	Heart Failure	Chronic bronchitis	Symptoms involving respiratory system & other chest symptoms
Diagnosis 8	Disorders of fluid, electrolyte, & acid-base imbalance	Symptoms involving digestive system	Episodic mood disorders	Chronic bronchitis	Other cellulitis/abscess	Heart Failure	Other diseases of lung
Diagnosis 9	Symptoms involving digestive system	Schizophrenic disorders	Chronic bronchitis	Schizophrenic disorders	General Symptoms	Other cellulitis/abscess	Pneumonia, organism unspecified
Diagnosis 10	Diabetes mellitus	Episodic mood disorders	Diabetes mellitus	Septicemia	Pneumonia, organism unspecified	General Symptoms	Other cellulitis/abscess

Table 60. All Managed Care Organizational State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate versus Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$19,054,636	$13,545,822	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$341,583	$239,985	Premium and maintenance taxes
C	**Total Net Revenue**	**$18,713,053**	**$13,305,836**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$16,761,820	$11,245,149	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$1,600,703	$1,144,275	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$18,362,523**	**$12,389,425**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$350,530**	**$916,411**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	8.6%	8.6%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	1.9%	6.9%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$20,983	$43,955	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$7,583	$84,114	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$1,045	$97,999	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$1,077	$64,027	MCO Share: 20%; Texas Share: 80%
	> 12%	$3,815	$11,872	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$34,503**	**$301,968**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	89.6%	84.5%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target			Varies depending on size of MCO
L	MLR under target			Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$14,852**	**$243,180**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$19,650**	**$58,787**	Experience Rebate – MLR Rebate

Table 61. Aetna Better Health State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
	Financial Statistical Report			
				Revenues
A	Total Gross Revenues	$309,855	$230,354	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$5,382	$4,004	Premium and maintenance taxes
C	**Total Net Revenue**	**$304,473**	**$226,350**	Gross revenue minus premium and maintenance taxes (A-B=C)
				Expenses
D	Medical and prescription expenses	$257,632	$169,395	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$25,511	$17,726	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$283,143**	**$187,122**	Sum of medical and prescription expenses and administrative expense (D+E=F)
				Income
G	**Net Income Before Taxes**	**$21,330**	**$39,229**	Total net revenue minus total expenses (C-F=G)
	Experience Rebate Calculation			
H	Administrative Percent	8.4%	7.8%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	7.0%	17.3%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$1,239	$921	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$2,355	$1,843	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$2,764	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$5,528	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$11,518	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$3,594**	**$22,575**	
	Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)			
J	MLR Percent	84.6%	74.8%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0.4%	10.2%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$1,170**	**$23,409**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$2,424**	**($835)**	Experience Rebate – MLR Rebate

Table 62. Amerigroup State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$4,064,602	$2,784,008	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$74,073	$48,945	Premium and maintenance taxes
C	**Total Net Revenue**	**$3,990,530**	**$2,735,063**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$3,529,620	$2,228,532	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$325,686	$215,365	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$3,858,305**	**$2,443,897**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$132,224**	**$291,167**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	8.2%	7.9%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	3.3%	10.6%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$5,690	$11,136	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$22,272	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$33,408	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$33,408	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$5,690**	**$100,224**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	88.4%	81.5%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	3.5%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$97,994**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$5,690**	**$2,230**	Experience Rebate – MLR Rebate

Table 63. Blue Cross/Blue Shield of Texas State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$60,454	$59,631	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$1,094	$1,067	Premium and maintenance taxes
C	**Total Net Revenue**	**$59,361**	**$58,563**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$49,518	$51,097	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$13,199	$10,846	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$62,717**	**$61,943**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**($3,357)**	**($3,380)**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	22.2%	18.5%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	-5.7%	-5.8%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$242	$24	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$484	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$218	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$943**	**$24**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	83.4%	87.3%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Small Insurer)	80%	80%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$943**	**$24**	Experience Rebate – MLR Rebate

Table 64. Community First State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$360,613	$287,580	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$6,533	$5,071	Premium and maintenance taxes
C	**Total Net Revenue**	**$354,080**	**$282,509**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$329,515	$229,667	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$30,015	$23,008	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$359,531**	**$252,676**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**($5,450)**	**$29,834**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	8.5%	8.1%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	-1.5%	10.6%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$1,150	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$2,301	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$3,451	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$3,221	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$10,123**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	93.1%	81.3%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	3.7%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$10,654**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**($531)**	Experience Rebate – MLR Rebate

Table 65. Community Health Choice State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

	Financial Statistical Report		
		2012-2013 (18 months)	2014	Description
	Revenues			
A	Total Gross Revenues	$985,345	$703,259	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$17,759	$12,621	Premium and maintenance taxes
C	**Total Net Revenue**	**$967,586**	**$690,638**	Gross revenue minus premium and maintenance taxes (A-B=C)
	Expenses			
D	Medical and prescription expenses	$899,564	$616,959	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$73,803	$56,146	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$973,368**	**$673,105**	Sum of medical and prescription expenses and administrative expense (D+E=F)
	Income			
G	**Net Income Before Taxes**	**($5,781)**	**$17,533**	Total net revenue minus total expenses (C-F=G)
	Experience Rebate Calculation			
H	Administrative Percent	7.6%	8.1%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	-0.6%	2.5%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$0	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$0**	
	Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)			
J	MLR Percent	93%	89.3%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**$0**	Experience Rebate – MLR Rebate

Table 66. Christus State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$44,880	$23,619	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$794	$413	Premium and maintenance taxes
C	**Total Net Revenue**	**$44,086**	**$23,206**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$29,151	$17,965	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$5,755	$3,878	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$34,906**	**$21,843**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$9,180**	**$1,363**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	13.1%	16.7%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	20.8%	5.9%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$180	$94	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$359	$189	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$539	$283	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$1,077	$567	MCO Share: 20%; Texas Share: 80%
	> 12%	$3,815	$354	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$5,969**	**$1,488**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	66.1%	77.4%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Small Insurer)	80%	80%	
L	MLR under target	13.9%	2.6%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$6,227**	**$611**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**($258)**	**$877**	Experience Rebate – MLR Rebate

Table 67. Cook Children's State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
		Financial Statistical Report		
		Revenues		
A	Total Gross Revenues	$328,124	$288,417	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$6,906	$5,139	Premium and maintenance taxes
C	**Total Net Revenue**	**$375,218**	**$283,278**	Gross revenue minus premium and maintenance taxes (A-B=C)
		Expenses		
D	Medical and prescription expenses	$339,388	$246,224	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$29,035	$20,897	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$368,423**	**$267,122**	Sum of medical and prescription expenses and administrative expense (D+E=F)
		Income		
G	**Net Income Before Taxes**	**$6,795**	**$16,157**	Total net revenue minus total expenses (C-F=G)
		Experience Rebate Calculation		
H	Administrative Percent	7.7%	7.4%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	1.8%	5.7%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$1,154	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$692	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$1,846**	
		Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)		
J	MLR Percent	90.5%	86.9%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**$1,846**	Experience Rebate – MLR Rebate

Table 68. Driscoll Children's State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

	Financial Statistical Report			
		2012-2013 (18 months)	2014	Description
	Revenues			
A	Total Gross Revenues	$480,773	$355,089	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$8,601	$6,273	Premium and maintenance taxes
C	**Total Net Revenue**	**$472,172**	**$348,815**	Gross revenue minus premium and maintenance taxes (A-B=C)
	Expenses			
D	Medical and prescription expenses	$396,582	$320,517	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$43,368	$29,749	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$439,950**	**$350,265**	Sum of medical and prescription expenses and administrative expense (D+E=F)
	Income			
G	**Net Income Before Taxes**	**$32,222**	**($1,450)**	Total net revenue minus total expenses (C-F=G)
	Experience Rebate Calculation			
H	Administrative Percent	9.2%	10.3%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	6.8%	2.5%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$1,923	$0	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$3,846	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$288	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$6,058**	**$100,224**	
	Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)			
J	MLR Percent	84%	91.9%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	1.0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$4,764**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$1,294**	**$0**	Experience Rebate – MLR Rebate

Table 69. El Paso First State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

	Financial Statistical Report			
		2012-2013 (18 months)	2014	Description
	Revenues			
A	Total Gross Revenues	$190,179	$139,413	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$3,478	$2,491	Premium and maintenance taxes
C	**Total Net Revenue**	**$186,702**	**$136,922**	Gross revenue minus premium and maintenance taxes (A-B=C)
	Expenses			
D	Medical and prescription expenses	$156,005	$119,482	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$20,362	$14,066	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$176,367**	**$133,549**	Sum of medical and prescription expenses and administrative expense (D+E=F)
	Income			
G	**Net Income Before Taxes**	**$10,334**	**$3,373**	Total net revenue minus total expenses (C-F=G)
	Experience Rebate Calculation			
H	Administrative Percent	10.9%	10.3%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	5.5%	2.5%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$761	$0	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$539	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$1,300**	**$0**	
	Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)			
J	MLR Percent	83.6%	87.3%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	1.4%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$2,691**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**($1,391)**	**$0**	Experience Rebate – MLR Rebate

Table 70. FirstCare State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical
Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$440,102	$301,622	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$7,829	$5,350	Premium and maintenance taxes
C	**Total Net Revenue**	**$432,273**	**$296,271**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$405,407	$279,305	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$41,916	$30,476	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$447,323**	**$309,781**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**($15,050)**	**($13,510)**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	9.7%	10.3%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	-3.5%	-4.6%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$0	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$0**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	93.8%	94.3%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	3.5%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**$0**	Experience Rebate – MLR Rebate

Table 71. HealthSpring State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$412,726	$333,392	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$7,223	$5,967	Premium and maintenance taxes
C	**Total Net Revenue**	**$405,504**	**$327,424**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$349,443	$288,173	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$37,015	$30,361	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$387,015**	**$318,534**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$18,489**	**$8,891**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	9.3%	9.3%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	4.6%	2.7%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$1,321	$1,334	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$533	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$1,321**	**$1,867**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	86.2%	88.0%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$1,321**	**$1,867**	Experience Rebate – MLR Rebate

Table 72. Molina Healthcare State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$2,015,002	$1,304,416	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$35,701	$22,994	Premium and maintenance taxes
C	**Total Net Revenue**	**$1,979,301**	**$1,281,423**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$1,750,374	$1,075,319	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$226,270	$167,334	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$1,976,644**	**$1,242,652**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$2,657**	**$38,770**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	11.4%	13.1%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	0.1%	3.0%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$4,030	$5,218	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$10,435	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$10,957	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$4,030**	**$26,610**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	88.4%	83.9%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	1.1%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$14,140**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$4,030**	**$12,470**	Experience Rebate – MLR Rebate

Table 73. Parkland State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$786,672	$521,233	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$14,126	$9,234	Premium and maintenance taxes
C	**Total Net Revenue**	**$772,546**	**$511,999**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$674,682	$411,044	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$36,384	$48,210	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$744,066**	**$459,254**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$28,480**	**$52,745**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	9.0%	9.4%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	3.7%	10.3%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$944	$2,085	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$4,170	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$6,255	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$4,587	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$944**	**$17,096**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	87.3%	80.3%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	4.7%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$24,591**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$944**	**($7,494)**	Experience Rebate – MLR Rebate

Table 74. Scott & White State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$148,279	$130,197	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$2,608	$2,317	Premium and maintenance taxes
C	**Total Net Revenue**	**$145,671**	**$127,880**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$135,700	$116,766	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$17,375	$13,172	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$153,074**	**$129,938**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**($7,403)**	**($2,057)**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	11.9%	10.3%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	-5.1%	-1.6%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$0	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$0**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	93.2%	91.3%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**$0**	Experience Rebate – MLR Rebate

Table 75. Sendero State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$47,696	$36,082	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$852	$639	Premium and maintenance taxes
C	**Total Net Revenue**	**$46,844**	**$35,442**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$40,743	$42,948	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$9,617	$6,326	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$50,360**	**$49,274**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**($3,516)**	**($13,831)**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	20.5%	17.8%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	-7.5%	-39%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$0	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$0**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	87%	121.2%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Small Insurer)	80%	80%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**$0**	Experience Rebate – MLR Rebate

Table 76. Seton State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$75,181	$54,152	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$1,360	$980	Premium and maintenance taxes
C	**Total Net Revenue**	**$73,821**	**$53,172**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$62,110	$42,848	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$10,208	$6,591	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$72,318**	**$49,439**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$1,503**	**$3,733**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	13.8%	12.4%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	2%	7.0%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$226	$217	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$433	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$585	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$226**	**$1,235**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	84.1%	80.6%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Small Insurer)	80%	80%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$226**	**$1,235**	Experience Rebate – MLR Rebate

Table 77. Superior State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report			
				Revenues
A	Total Gross Revenues	$5,607,810	$3,994,850	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$100,082	$71,086	Premium and maintenance taxes
C	**Total Net Revenue**	**$5,507,728**	**$3,923,764**	Gross revenue minus premium and maintenance taxes (A-B=C)
				Expenses
D	Medical and prescription expenses	$5,028,639	$3,298,690	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$415,811	$229,622	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$5,444,450**	**$3,598,312**	Sum of medical and prescription expenses and administrative expense (D+E=F)
				Income
G	**Net Income Before Taxes**	**$63,278**	**$325,451**	Total net revenue minus total expenses (C-F=G)
				Experience Rebate Calculation
H	Administrative Percent	7.5%	7.6%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	1.1%	8.3%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$15,979	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$31,959	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$26,366	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$74,304**	
				Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)
J	MLR Percent	91.3%	84.1%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	0.9%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$37,171**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**$37,134**	Experience Rebate – MLR Rebate

Table 78. Texas Children's Health Plan State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$1,166,469	$837,682	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$21,077	$14,942	Premium and maintenance taxes
C	**Total Net Revenue**	**$1,145,392**	**$822,740**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$1,046,897	$754,901	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$80,444	$58,014	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$1,127,341**	**$812,916**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$18,051**	**$9,825**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	7.0%	7.1%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	1.6%	1.2%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$0	$0	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$0	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$0	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$0	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$0**	**$0**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	91.4%	91.8%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	0%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$0**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$0**	**$0**	Experience Rebate – MLR Rebate

Table 79. UnitedHealthcare State Fiscal Years 2012 - 2014 Financial Statistical Report and Experience Rebate vs. Medical Loss Ratio calculations (amounts presented in thousands)

		2012-2013 (18 months)	2014	Description
Financial Statistical Report				
Revenues				
A	Total Gross Revenues	$1,475,872	$1,160,825	Sum of medical premiums, delivery supplemental payments, pharmacy premiums, investment income, and other revenue
B	Taxes	$26,106	$20,451	Premium and maintenance taxes
C	**Total Net Revenue**	**$1,449,766**	**$1,140,375**	Gross revenue minus premium and maintenance taxes (A-B=C)
Expenses				
D	Medical and prescription expenses	$1,280,848	$935,318	Includes fee-for-service, capitated services, patient centered medical home services, net reinsurance costs, IBNR[1] accrual- medical, prescription expenses (excluding PBM[2] admin), and other expenses
E	Administrative expenses	$122,373	$92,487	Total administrative dollars reported by Managed Care Organization
F	**Total Expenses**	**$1,403,211**	**$1,027,804**	Sum of medical and prescription expenses and administrative expense (D+E=F)
Income				
G	**Net Income Before Taxes**	**$46,545**	**$112,570**	Total net revenue minus total expenses (C-F=G)
Experience Rebate Calculation				
H	Administrative Percent	8.4%	8.1%	Percent of total net revenue spent on administrative expenses (E/C=H)
I	Net Income Percent	3.2%	9.9%	Percent of total net revenue that is net income (G/C=I)
	Experience Rebate:			
	< 3%	$0	$0	MCO Share: 100%; Texas Share: 0%
	3% to 4.99%	$4,428	$4,643	MCO Share: 80%; Texas Share: 20%
	5% to 6.99%	$0	$9,287	MCO Share: 60%; Texas Share: 40%
	7% to 8.99%	$0	$13,930	MCO Share: 40%; Texas Share: 60%
	9% to 11.99%	$0	$16,716	MCO Share: 20%; Texas Share: 80%
	> 12%	$0	$0	MCO Share: 0%; Texas Share: 100%
	Experience rebate	**$4,428**	**$44,576**	
Medical Loss Ratio (MLR) Calculation (in NAIC[3] Format)				
J	MLR Percent	88.3%	82%	Percent of total net revenue spent on medical and prescription expenses (D/C=J)
K	MLR Target (Large Insurer)	85%	85%	
L	MLR under target	0%	3%	Target less calculated MLR percent (K-J=L)
M	**MLR rebate**	**$0**	**$34,611**	Percent of MLR under target times the total gross revenue (L*A=M)
	Difference	**$4,428**	**$9,965**	Experience Rebate – MLR Rebate

APPENDIX C:
CHANGES IN COLLABORATION AMONG ORGANIZATIONS

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BACKGROUND FOR EVALUATION GOAL 9

One specific aim of the Demonstration is to increase the efficiency of service delivery and reduce costs through system transformation that emphasizes collaboration and integration of services. Twenty regional healthcare partnerships (RHP) were created across the state as a structure for managing implementation of Delivery System Reform Incentive Payment DSRIP and uncompensated care (UC) within the Demonstration. RHPs could be characterized as mandated partnerships—the creation of which was required by external forces (Centers for Medicare and Medicaid Services (CMS) and the Texas Health and Human Services Commission (HHSC)) with clear financial incentives at stake for participating organizations. Organizational participation in an RHP was voluntary. However, participation in the RHP in which an organization is geographically located was necessary for that organization to participate in the UC or DSRIP programs. Although RHP formation created some new relationships, the development of many RHPs were built upon a pre-existing core of interorganizational relationships. The RHPs represent networks comprised of relationships within sectors (i.e., hospitals, community mental health centers, public health departments, physician practices), as well as relationships across sectors (i.e. relationships between hospitals and governmental entities, community mental health centers and public health departments, or other public-private partnerships). The composition of these RHPs varies, but at minimum includes the anchor institution (administratively responsible for coordination), participating intergovernmental transfer (IGT) entities, and DSRIP performing providers.

Establishing and strengthening relationships among stakeholders within these regions is intended to improve capacity to collaborate and deliver health services more efficiently and effectively, particularly to the uninsured and those covered by Medicaid. Promoting collaboration among organizations requires them to engage in relationships with a broader range of organizations that facilitate exchange of information and resources (Glisson & James, 1992).

Table 1. Key Terms and Definitions

Key Term	Definition
Anchor	Administrative organization tasked with coordination of RHP activities and reporting. The anchor must be a public entity.
Centralization	A measure of the extent to which network ties are structured around one or a few organizations.
Degree centrality	The number of ties a node has at a certain point in time.
Density	The number of existing ties among the network organizations as a proportion of the total possible ties.
Intergovernmental transfer (IGT) providers or entities	Cities, counties, hospital districts, hospital authorities, and academic health science centers that have public funds eligible for state match under the waiver.
Interorganizational network	A defined network of organizations that may work together for a common purpose (e.g. Demonstration implementation).
Intersectoral ties	Intersectoral ties are connections that exist between organizations in different sectors of the health care delivery system.
Learning collaborative	A regional approach to quality improvement. All RHPs were required to organize and implement a learning collaborative unless the RHP was designated as Tier 4.
Multiplexity	A measure of the strength of collaboration (or ties) between two organizations. Multiplexity is higher when organizations collaborate in more than one way.
Node	A network node represents a single organization in the network.

Other stakeholders	Organizations that do not formally participate in UC, DSRIP, or Medicaid Managed Care but have a stake or interest in the outcomes of the Demonstration.
Regional Healthcare Partnership (RHP)	The RHPs serve as a mechanism to plan, implement, and track DSRIP projects and UC payments.
Performing providers	Organizations that participate in DSRIP. Eligible performing provider organizations included public and private hospitals, community mental health centers, academic health science centers, public health departments, and physician practices.
Tie	Collaboration between two organizations.
T_0	Designates a time period of the Interorganizational network study. T_0 relates to twelve (12) months prior to the creation of the RHPs, approximating calendar year 2011.
T_1	Designates a time period of the Interorganizational network study. T_1 approximates calendar year 2013.
T_2	Designates a time period of the Interorganizational network study. T_2 approximates calendar year 2015.

EVALUATION GOAL

Prior research suggests networks aid service providers in coordinating service delivery functions and activities, thereby improving the quality, effectiveness, or efficiency of services to clients (Isett & Provan, 2005). Evaluation Goal 9 specifically addresses these networks:

Evaluation Goal 9: Evaluate the extent to which the establishment of RHPs increased collaboration among health care organizations and stakeholders in each region.

Addressing Evaluation Goal 9 may hold significant implications for future Demonstration activities, specifically those related to the DSRIP program. The results of this portion of the evaluation will yield important information about the following:

- The extent to which each RHP achieved collaboration;
- Structural or contextual differences between the RHPs that may have affected their collaboration;
- Whether the formation of the RHPs increased collaboration across sectors; and
- Whether this collaboration extended to service delivery.

Different disciplines and lines of research view networks from a variety of perspectives; however, common themes include relationships, social interaction of organization members, connectedness, collective action, trust, and cooperation (Provan, Fish, & Sydow, 2007). A basic definition of a network is provided by Brass and colleagues as "a set of nodes and the set of ties representing some relationships, or lack of relationship, between the nodes" (Brass, Galaskiewicz, Greve, & Tsai, 2004, p. 795). In interorganizational network terms, a node is an organization, and a tie is a type of relationship between two nodes, such as information sharing, joint service delivery, or resource sharing.

Key characteristics that are important to understand when examining networks include:

- *Boundaries*—Network boundaries identify which organizations are included and excluded from a network, which can sometimes be difficult to ascertain (Foster-Fishman, Salem, Allen, & Fahrbach, 2001; Laumann, Marsden & Prensky, 1983). In the case of the 20 RHPs, membership rosters of participating organizations were submitted with the RHP plan and provide clear boundaries for the evaluation.

- *Density*—Network density is the number of existing ties among the network organizations as a proportion of the total possible ties (Wasserman & Faust, 1994). It is calculated by dividing the number of existing ties by the number of total possible ties in a network. Density illustrates the connectedness of organizations, which can provide a conduit for resource exchange and collaboration. Networks with very little density reflect organizations that are not interconnected, while networks with high density reflect substantial connectedness among the network members. Extremely high levels of network density are not necessarily beneficial (Provan et al., 2007), and Valente, Chou, & Pentz (2007) suggest that networks need to balance density and centralization to be effective. It is expected that the RHPs across the state will vary in density at baseline, reflecting the presence of some strong pre-existing collaborative relationships among organizations and other organizations that have historically been less connected.

- *Centralization*—Network centralization is measured by the number and proportion of organizations that hold central positions in the network (Scott, 2013). Networks with fewer identified central organizations are considered more highly centralized, while networks with ties more evenly distributed among members are considered more decentralized. In the RHPs, it is anticipated that networks would be centralized around organizations that are providing substantial resources or influence (e.g., significant IGT providers; anchor institutions).

  Identification of Central Organizations—Understanding which organizations are more central to the network highlights those that are more likely to serve as a hub for information or resource exchange, or can serve in a broker role for other organizations in the network (Provan et al., 2007). Central organizations are identified using a measure of their centrality, specifically degree centrality. Degree centrality is the number of ties a node has at a certain point in time. Using this approach, the most central organizations would be those with the most ties.

  Network centralization is calculated using degree centrality for each individual node in the network, adding together the differences between each node's centrality and the centrality of the most central node, then dividing by the maximum possible ties in the network (Borgatti, Everett, and Johnson 2013). Centralization is reported at the network level.

- *Multiplexity*—The concept of multiplexity is based on the number and types of ties between network organizations (Tichy, Tushman, & Fombrun, 1979); multiplex ties between organizations—such as organizations that refer clients to each other's services, share client data, and participate in joint staff trainings—suggest stronger relationships because if one of those ties were to erode, others would remain to keep the organizations connected (Provan et al., 2007). Although calculated at the organization level, this characteristic can be aggregated to provide information at the whole network level. In the RHPs, the relationships strength will be assessed by the ways in which organizations are collaborating to serve the low-income (i.e., uninsured and Medicaid) population.

- *Intersectoral ties*—Intersectoral ties are connections that exist between organizations in different sectors of the health care delivery system (e.g. a hospital has a tie with a community mental health center or a public health department has a tie with a physician

group). Intersectoral ties may indicate a higher likelihood of service integration (Foster-Fishman et al., 2001).

The network literature and the context of Texas' formation of the RHPs suggest specific hypotheses for how the collaborative relationships of organizations participating in the Demonstration might change over time.

HYPOTHESES

H_1. The formation of RHPs leads to increased network density over time.

H_2. The formation of RHPs leads to increased network multiplexity (strength) over time.

H_3. The formation of RHPs leads to increased intersectoral ties over time.

Although not necessarily a characteristic unique to network analysis, understanding the structures and processes that govern the network are important in understanding how the network performs (Lasker, Weiss, & Miller, 2001). The stakeholder survey conducted for Evaluation Goals 10 and 11 (see Appendix D) assessed perceptions related to those structures and methods, and will provide context for understanding these results at the conclusion of the evaluation.

One intended outcome of the creation of the RHPs is increased collaboration, which adds value through increasing the network's capacity to generate and disseminate innovative solutions to persistent health care issues (Lasker et al., 2001), particularly in the current environment of rapid change. Interorganizational collaboration has been defined as a process that fosters independent organizations to leverage their resources to achieve objectives they cannot bring about on their own (Lasker et al., 2001).

LITERATURE REVIEW

Assessing Whole Networks

Research into networks can assess structural and contextual characteristics and outcomes at the organizational level or at the whole network level. While some networks emerge organically through community changes in response to a particular priority, most network research focuses on those that were purposefully created, are more formally structured, and have specific goals (Provan et al., 2007). In the Demonstration, the RHPs are comprised of some organizations with historical relationships and some relationships that were developed in response to a particular priority related to the Demonstration. In any network, the ties themselves may be formal or informal, trust-based or contractually bound—with substantial variation in between. To assess the effectiveness of networks at achieving collective objectives, analysis must be at the level of the interorganizational network (Provan & Milward, 1995; Provan et al., 2007). The structural and contextual factors of a network, including core centralization and network density, contribute to information dissemination and decision-making, thus impacting network effectiveness.

One powerful tool for examining the patterns of relationships and exchanges among organizations in a network focused on service delivery is an interorganizational network analysis (Morrissey, 1992; Provan & Milward, 1995; Valente et al., 2007). Analysis of interorganizational networks provides a clearer understanding of the relationships between specific organizations, as well as the network as a whole (Butterfoss & Kegler, 2009). Results of network analysis are typically illustrated visually to depict the number and strength of ties (i.e., relationships) among organizations (Scott, 2013). The current analysis focuses on each RHP as a distinct network (N=20) and offers summary data for the state as a whole; reporting the means across RHPs reflects average change across the state. When measured over time, changes in the frequency, reciprocity, and nature of network ties and interactions may indicate increased network capacity through increased collaboration. As interorganizational relationships mature, the complexity of those relationships is also likely to increase (Provan & Milward, 2001), resulting in strengthened relationships and continued collaboration.

Another framework for assessing collaboration among RHP members is an inter-agency collaborative model based on the works of Van de Ven and Ferry (1980), Morrissey, Hall, and Lindsey (1982), and Alter and Hage (1993). The outcomes of this model include satisfaction with the collaboration, productivity, and successfully reaching the goals of the collaboration effort (in this case, RHP collaboration to implement the UC and DSRIP portion of the Demonstration). Several questions related to interagency processes and outcomes were included in the RHP stakeholder survey collected for Evaluation Goals 10 and 11 (see Appendix D). Inter-agency processes capture the extent to which information about the focus of the coordination effort is shared across agencies, sources of common funding for the initiative or program, and the actual coordination of joint or interrelated activities among agencies.

Prior Empirical Findings

A considerable body of research highlights the key characteristics of networks—particularly those involved in service delivery. In general, the research indicates that network density increases over time (Venkatraman & Lee, 2004). Valente et al. (2007) also found that networks with higher density possess more potential pathways for exchange of information and resources to flow relative to less dense networks. More centralized networks with a few key "hub" organizations can use those hubs to disseminate information and innovative ideas more quickly than less centralized networks. As these network ties are formed, the network structure and the content of the interorganizational ties evolve. DiMaggio and Powell (1983) posit that when networks have mechanisms in place that promote organizations learning from one another, as the network develops it is more likely to evolve in ways that yield outcomes. This may be particularly relevant to the RHPs through the Learning Collaborative mechanism, as they seek formal ways of promoting organizational learning and development of new solutions to persistent issues.

The creation of the RHPs was the structure through which HHSC implemented DSRIP and UC. All organizations eligible to participate in these programs were required to participate in the RHP that covered their geographic location to receive UC or DSRIP funding. Eligibility was defined by HHSC and CMS. Human and Provan (2000) found that networks that are mandated rather than

those that develop organically based on existing relationships are more likely to fail. This is, in part, attributed to the defined expectations and inherent accountability of mandated networks and typically the financial implications of inadequate participation. This poses an interesting question for the RHPs, given the juxtaposition of a state policy implemented through the creation of regional partnership structures, many of which built on existing relationships among organizations between and among both public and private sector organizations. In a study of public sector networks, Isett and Provan (2005) found that relationships among public sector organizations develop differently than previously reported in private/nonprofit sector organizations, perhaps based on different dynamics related to competition and accountability structures. This could be based on the catalyst and context of the network formation, as well as the different nature of requirements of public funding and accountability and the different structures needed to demonstrate that those requirements are met. In studying management and governance of service delivery networks, Provan and Milward (1995) found that centralization was more effective than decentralization: "Networks integrated and coordinated centrally, through a single core agency, are likely to be more effective than dense, cohesive networks integrated in a decentralized way among the organizational providers that make up the system" (p. 24).

EVALUATION DESIGN

Given that the RHPs are envisioned as the structure through which transformation is taking place, it is important to examine the networks as a whole (e.g. network characteristics and network outcomes of each RHP). Evaluation Goal 9 used a non-randomized, pre-post study design to study network outcomes of each RHP. The best quantitative measure for whole networks is an interorganizational network analysis where each organization reports on ties with each of the other organizations in the network (Provan et al., 2007). The evaluation team used this analytic method to assess the RHP-level networks. In addition, qualitative questions were added as a follow up to each quantitative question to gain additional contextual information about the content of the ties. Data collection focused on gathering information about interorganizational ties during three time periods:

1. Twelve (12) months prior to the creation of the RHPs (referenced hereafter as T_0)
2. Calendar year 2013 (referenced hereafter as T_1)
3. Calendar year 2015 (referenced hereafter as T_2)

The data collection instrument is included at the end of this appendix.

DATA COLLECTION

Interorganizational network data for T_0 and T_1 were collected between January and May of 2014. There was no possibility of collecting T_0 data as it was happening, but this information is extremely important in understanding changes in relationships among network members. Howard and Dailey (1979) recommend a method of asking respondents to report twice on each self-report measure, asking first to report on the current time period and asking immediately

after to report on the pre-intervention time period; they assert that this removes any response-shift bias because both answers are contextualized by the respondent from the same perspective (i.e., their post-intervention response does not simply reflect a more sophisticated understanding of the purpose of the intervention than when they were pre-tested). Data for T_2 were collected between January and mid-July of 2016.

The sampling frame for Evaluation Goal 9 is all anchor institutions and organizations participating in DSRIP (IGT entities and performing providers) in all 20 RHPs. Organizations participating only in UCUC (N=92) were excluded from the study since these organizations have a more limited role in their RHP, restricted primarily to reporting and administrative interaction with their anchor. Data were collected at the organizational level (sampling frame: N=388 participating organizations for all 20 RHPs at T_0/T_1, and n=406 participating organizations for all 20 RHPs at T_2; the unit of analysis is at the RHP level (N=20).

To identify the most appropriate and knowledgeable respondent for each organization to be surveyed, the evaluation team asked each RHP's anchor institution to provide information about the nature of the survey questions and content to their member organizations and have each organization provide contact information for their designated respondent. The anchor institutions compiled and submitted the contact information to the evaluation team for each round of data collection. The identified respondent for each organization was then contacted by email to schedule a time for the phone-administered survey asking them to report on their organization's relationship with each of the other organizations in the RHP. Within the network analysis literature, a single key informant approach is commonly used, but it is predicated on the assumption that the survey questions are focused such that a single respondent from the organizations would be knowledgeable about the range of interorganizational exchanges (Foster-Fishman et al., 2001). Thus, the specific survey questions were limited to administrative level interactions, rather than front-line service delivery.

Data were collected via computer-assisted telephone surveys with representatives of each participating organization. In some cases, the respondent elected to invite other organizational representatives to join the phone survey via conference call or speaker phone. An information sheet summarizing respondent participation was emailed to participants prior to each phone call, and reviewed with participants at the beginning of the survey. The survey was loaded into Qualtrics® to manage question flow and allow for electronic documentation of responses.

<u>MEASURES</u>

The network survey was structured such that each organization answered a series of questions about their relationship with each of the other organizations in their RHP (Provan & Milward, 1995; Provan & Milward, 2001). Measures used are provided in Table 2. In addition, open-ended questions were added to probe for qualitative information about the relationship, kinds of collaborative services, or nature of data sharing to assist in interpretation of the results.

Table 2. Network Measures

Construct	T₀ (Pre-Waiver) Measures	T₁ (2013) & T₂ (2015) Measures	Source
Any Collaboration*	"In the year prior to the establishment of RHP [#], did your organization work with [x organization] at all?"	"Does your organization currently work with [x organization]?"	Provan & Milward, 1995
Joint Service Delivery	"In the year prior to the establishment of RHP [#], did your organization collaborate with [x organization] to deliver services?"	"Does your organization currently collaborate with [x organization] to deliver services?"	Foster-Fishman et al., 2001; Provan & Milward, 1995
Resource Sharing	"In the year prior to the establishment of RHP [#], did your organization share tangible resources with [x organization] for the purpose of increasing access to services?"	"Does your organization currently share tangible resources with [x organization] for the purpose of increasing access to services?"	Provan, Nakama, Veazie, Teufel-Shone & Huddleston, 2003
Data Sharing	"In the year prior to the establishment of RHP [#], did your organization have an agreement in place to share patient data with [x organization]?"	"Does your organization currently have a data sharing agreement with [x organization]?"	Johnsen, Morrissey, & Calloway, 1996
Attitudes Toward Building Ties		"Given the opportunity, would your organization be willing to collaborate with [x organization] in the future?"	New measure

ANALYSIS

Quantitative survey responses for each organization from T_0, T_1, and T_2 were arranged into a square adjacency matrix format using network software Ucinet 6 (Borgatti, Everett, & Freeman, 2002). Each matrix includes all organizations participating in DSRIP for a respective RHP in both the rows and columns, creating an N by N matrix as shown below:

	Organization 1	Organization 2	Organization 3
Organization 1	-	1	0
Organization 2	1	-	1
Organization 3	0	1	-

In this matrix, each cell represents the tie(s) between two organizations; the diagonal of the matrix is left empty since ties between an organization and itself are not a relevant construct. This is referred to as an N by N matrix format, with N representing the number of organizations in a network. Each RHP has separate matrices for each tie type in each of the time periods presented in this report (T_0, T_1, and T_2). In addition, network diagrams were created using companion software NetDraw 2 (Ucinet 6, NetDraw 2).

Because the response rates were not 100% in all RHPs, the data were symmetrized to reflect relationships between organizations if one of the responding organizations indicated collaboration. Symmetrization refers to the process of matching corresponding data between organizations. For example, if Organization A indicates a tie with Organization B, and Organization B either did not participate in the study or did not note the same tie, it is assumed that the tie exists because one of the organizations indicated that it did. The final data show a tie between them as if it were indicated by both organizations (making the matrix symmetrical). While assuming reciprocity of a tie is not the most conservative approach, depending on

confirmed relationships or relationships that are indicated by both organizations may actually fail to show relationships that actually exist (Bolland & Wilson, 1994; Foster-Fishman et al., 2001).

Responses from T_0, T_1, and T_2 were analyzed for the average number of organizational ties, centralization, and density. Density was calculated by dividing the number of existing ties by the number of total possible ties in a network. Network centralization is calculated using degree centrality for each individual node in the network, adding together the differences between each node's centrality and the centrality of the most central node, then dividing by the maximum possible ties in the network (Borgatti, Everett, and Johnson 2013). Multiplexity was evaluated by adding the matrices of each tie type (program and service delivery, sharing tangible resources, formal data sharing agreement); if all types of ties are present, the maximum strength of a tie between two organizations is 3. Tie strength was measured by calculating the average number of ties between dyads across each RHP. Results presented by RHP include the densities, centralization scores, average number of organizational ties, and strength of ties for T_0, T_1, and T_2 (i.e., point-in-time estimates), as well as the percentage change between the two time periods for each measure (i.e., changes over time).

Network diagrams were created for each RHP to illustrate responses to each survey question. These analyses allow for examination of within-sector collaborations, inter-sectoral collaborations, collaborations across ownership type, establishment of new relationships, increasing multiplexity of relationships among organizations, and changes in centralization over time (Provan & Milward, 1995). Qualitative follow-up questions within the survey provided additional data to aid in interpretation of the analysis of each RHP's network, including which types of services are jointly delivered, or which types of data sharing agreements are in place.

Findings on each measure are reported by RHP and statewide. Statewide means were calculated by averaging the measure across the 20 RHPs. For example, the formula to calculate the statewide mean for network density would take a sum of all RHP densities and divide by 20. Since data were not collected across the entire state (i.e. the state itself was not the unit of analysis and therefore organizations were not asked about ties with organizations outside their RHP), this approach offers insight into changes across the state but does not reflect outcomes for the state as a whole network.

RESULTS

The following sections summarize the network analysis results. State-level results are presented first, followed by a discussion of RHP-level results.

Results are grouped by type of collaboration:

- Any type of collaboration (e.g. collaboration of any of the three types listed below);
- Collaboration to deliver programs and services (e.g. collaboration around specific DSRIP projects or other programs; collaboration around patient referrals);
- Sharing tangible resources (e.g. sharing office space, staff, equipment, transportation services, etc.); and
- Formal data sharing agreements (e.g. agreements to share patient data).

Since multiplexity measures the strength of relationships (assessed by the number and types of ties between organizations), these results are presented in the final section. Network diagrams are also presented throughout each section using RHP 15 as an example. This RHP was chosen based on its small size and visible network changes over time.

Respondent Profile

A total of 388 organizations were included in the sampling frame for the study at T_0/T_1. Between the two data collection periods, an additional 18 organizations were added to the sampling frame to accommodate performing providers and IGT entities for new 3-year projects. The overall response rate at T_0/T_1 was 84%, but response rates varied by RHP (range: 67% to 100%). During T_2 data collection, the overall response rate was 74% and, again, varied by RHP (range: 63% to 96%). A summary of RHP-level response rates is provided in Table 3.

Table 3. Response Rates by RHP

RHP	T_0/T_1 Data Collection		T_2 Data Collection	
---	Response Rate	# of Organizations in RHP	Response Rate	# of Organizations in RHP
RHP 1	76%	38	80%	40
RHP 2	100%	17	65%	17
RHP 3	86%	30	79%	33
RHP 4	76%	25	68%	25
RHP 5	89%	8	63%	8
RHP 6	67%	27	70%	27
RHP 7	94%	16	71%	17
RHP 8	81%	16	83%	18
RHP 9	84%	25	96%	25
RHP 10	77%	30	88%	33
RHP 11	85%	19	63%	19
RHP 12	81%	37	74%	39
RHP 13	90%	21	81%	21
RHP 14	100%	12	69%	13
RHP 15	100%	8	88%	8
RHP 16	100%	9	70%	10
RHP 17	84%	19	70%	20
RHP 18	90%	10	70%	10
RHP 19	92%	13	87%	15
RHP 20	88%	8	88%	8

State-Level Results

State-level results provided here represent the mean of each measure across RHPs (N=20). These results reflect the average changes observed across the state. On average statewide,

network density, centralization, mean number of organizational ties, and multiplexity increased from T_0 to T_1 and decreased from T_1 to T_2 (see Table 5). For each point-in-time estimate, relationships between organizations based on delivery of programs and services demonstrated the highest network density, centralization, and mean number of ties. The next highest set of network measures were for sharing tangible resources, followed by formal data sharing. Both the percentage point change (noted as Point Change in data tables) and the percentage change were calculated to determine changes over time. Although the network measures were lowest for formal data sharing at all three time points, the greatest percentage increase was observed for these ties from T_0 to T_2. Table 4 includes data on statewide changes in each measured network characteristic across the Demonstration period.

At each time period, the greatest number of ties were for program and service delivery; however, there was almost no change in the aggregate network density over the Demonstration period. In fact, program and service delivery ties experienced the smallest change over time in terms of both percentage points and percentage change. Alternatively, tangible resource sharing and formal data sharing ties represented fewer ties in total but experienced the greatest increase over the Demonstration period for each network characteristic – density, centralization, and mean number of network ties.

Table 4. Statewide Changes in Network Characteristics, 2012 to 2016.

	Network Density point change (% change)	Network Centralization point change (% change)	Mean Number of Ties point change (% change)	Multiplexity point change (% change)
Overall Collaboration	0 (0%)	3 (7%)	0.3 (6%)	0.2 (13%)
Program and Service Delivery	0 (0%)	2 (5%)	0.2 (5%)	
Tangible Resource Sharing	1 (7%)	5 (17%)	0.4 (21%)	
Formal Data Sharing	5 (50%)	9 (36%)	0.6 (44%)	

Table 4 includes summary state-level results. For ease of comparison, each state-level indicator is also included in the RHP-specific data tables in the following section.

Table 5. Summary of Network Characteristics, Means Across RHPs (n=20)

NETWORK DENSITY	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	36%	45%	36%	9	25%	-9	-20%	0	0%
Program and Service Delivery	33%	42%	33%	8	25%	-9	-21%	0	0%
Sharing Tangible Resources	13%	19%	14%	6	48%	-5	-28%	1	7%
Formal Data Sharing	10%	15%	14%	6	58%	-1	-5%	5	50%
NETWORK CENTRALIZATION	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	40%	49%	42%	10	24%	-7	-14%	3	7%
Program and Service Delivery	40%	44%	42%	4	11%	-2	-5%	2	5%
Sharing Tangible Resources	31%	40%	36%	9	29%	-3	-9%	5	17%
Formal Data Sharing	26%	37%	35%	10	40%	-1	-3%	9	36%
MEAN NUMBER OF TIES	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	5.5	6.7	5.8	1.2	22%	-0.9	-13%	0.3	6%
Program and Service Delivery	5.1	6.2	5.3	1.1	21%	-0.8	-14%	0.2	5%
Sharing Tangible Resources	1.9	2.6	2.3	0.7	39%	-0.3	-13%	0.4	21%
Formal Data Sharing	1.4	2.1	2.1	0.7	48%	-0.1	-3%	0.6	44%
STRENGTH OF TIES	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration	1.6	1.7	1.8	0.1	6%	0.1	6%	0.2	13%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Results by Tier

HHSC designated each of the 20 RHPs across the state into one of four categories determined by a formula that accounts for the proportion of the State's population in that RHP below 200 percent of the federal poverty level. Table 6 summarizes the tier definitions.

Table 6. Tier Definitions and Number of RHPs Designated

Tier Number	Tier Criteria	# RHPs Designated
1	Contains at least 15% of the state's total population under 200% of the federal poverty level*	1
2	Contains at least 7% and less than 15% of the state's total population under 200% of the federal poverty level*	3
3	Contains at least 3% and less than 7% of the state's total population under 200% of the federal poverty level*	6
4	Contains less than 3% of the state's total population under 200% of the federal poverty level;* does not have a public hospital; or has one or more public hospitals that , when combined, provide less than 1% of the region's uncompensated care	10

*Determined by the 2006-2010 American Community Survey for Texas.

The tier designations were used to determine both the funding allocation for each region from the DSRIP pool, as well as the requirements for each region to participate in DSRIP. For example, Tier 2 RHPs were required to have at least 12 projects from Categories 1 and 2 in their initial plan, with at least six from Category 2. The full requirements are available in the RHP Plan Companion Document available at https://hhs.texas.gov/sites/hhs/files/documents/laws-regulations/policies-rules/1115-docs/CompanionDoc.pdf.

In the evaluation, analysis by tier was originally intended to approximate rural vs. urban RHPs. However, upon closer examination of the composition of the RHPs, this is not entirely accurate. What the tier designations actually reflect is relative population, as well as poverty within the RHP. Regardless, the analysis by tier reveals variation among them that may point back to differences in the size of communities included, which may affect the number and types of organizations eligible to participate in that RHP, the amount of funds available for IGT, and the capacity of the region to manage planning and implementation of DSRIP projects.

Table 7 includes summary results by tier. In summary, Tier 1 and 2 RHPs experienced the largest increase in network density, centralization, and mean number of ties, while Tier 4 RHPs experienced either decreases or slight increases in these measures over time. The multiplexity results were more varied, with an observed increase in Tier 2, 3, and 4 RHPs and a decrease in the Tier 1 RHP. Based on these results, there is some evidence the observed changes in network structure do vary by geography, insomuch as the tier structures measures geographic differences.

Table 7. Summary of Network Characteristics by RHP Tier Designations

NETWORK DENSITY

	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration, Mean across RHPs	36%	45%	36%	9	25%	-9	-20%	0	0%
Tier 1 Mean	22%	24%	29%	3%	12%	4%	17%	7%	31%
Tier 2 Mean	24%	28%	29%	4%	15%	2%	6%	5%	21%
Tier 3 Mean	30%	38%	34%	8%	27%	-4%	-10%	4%	14%
Tier 4 Mean	44%	56%	39%	12%	27%	-17%	-30%	-5%	-11%

NETWORK CENTRALIZATION

	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration, Mean across RHPs	40%	49%	42%	10	24%	-7	-14%	3	7%
Tier 1 Mean	36%	81%	63%	45%	127%	-18%	-23%	27%	76%
Tier 2 Mean	38%	56%	56%	18%	48%	0%	0%	18%	47%
Tier 3 Mean	41%	47%	36%	6%	14%	-11%	-23%	-5%	-12%
Tier 4 Mean	39%	45%	40%	6%	15%	-5%	-11%	1%	2%

MEAN NUMBER OF TIES

	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration, Mean across RHPs	5.5	6.7	5.8	1.2	22%	-0.9	-13%	0.3	6%
Tier 1 Mean	6.3	7.1	9.2	0.7	12%	2.1	29%	2.8	44%
Tier 2 Mean	6.4	7.3	7.8	0.9	14%	0.5	7%	1.4	22%
Tier 3 Mean	5.7	6.8	6.1	1.2	21%	-0.8	-11%	0.4	8%
Tier 4 Mean	5.1	6.4	4.7	1.3	27%	-1.7	-26%	-0.3	-7%

STRENGTH OF TIES

	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
All Collaboration, Mean across RHPs	1.6	1.7	1.8	0.1	6%	0.1	6%	0.2	13%
Tier 1 Mean	1.7	1.8	1.6	0.03	2%	-0.2	-10%	-0.1	-8%
Tier 2 Mean	1.6	1.6	1.9	0.1	6%	0.2	15%	0.33	21%
Tier 3 Mean	1.7	1.8	1.8	0.1	7%	0.04	2%	0.15	9%
Tier 4 Mean	1.6	1.7	1.8	0.1	6%	0.1	8%	0.2	15%

RHP-Level Results

All Collaborations

The first set of RHP-level results is for any collaboration. Here, the analysis assesses whether organizations reported working together in any capacity measured in the study. Subsequent sections of this chapter present the results for specific types of collaboration that comprise these partnerships.

Density. The mean density across RHPs at T_0 was 36%, indicating that 36% of all possible relationships within the RHP existed. At T_1, the mean overall density was 45% (see Table 8). By T_2, the overall density for any collaboration had decreased to 36%—the level also measured at T_0. This represents a 25% overall increase in collaborative interorganizational relationships from T_0 to T_1 but an overall decrease of 20% from T_1 to T_2. Across the Demonstration period, network density increased in half of all RHPs, decreased in nine RHPs, and remained stable in one RHP (range of percentage change from T_0 to T_2: -59% to 108%). Table 8 details RHP-level results.

Table 8. Network Density by RHP, All Collaboration

NETWORK DENSITY									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	14%	22%	17%	8	54%	-5	-22%	3	21%
RHP 2	34%	38%	24%	4	11%	-14	-37%	-10	-30%
RHP 3	22%	24%	29%	3	12%	4	17%	7	31%
RHP 4	21%	26%	20%	5	25%	-6	-23%	-1	-3%
RHP 5	61%	75%	43%	14	24%	-32	-43%	-18	-29%
RHP 6	21%	28%	43%	7	36%	15	53%	22	108%
RHP 7	27%	27%	49%	0	0%	23	85%	23	85%
RHP 8	30%	30%	29%	0	0%	-1	-2%	-1	-2%
RHP 9	25%	28%	27%	4	15%	-1	-4%	3	11%
RHP 10	27%	27%	18%	0	-1%	-9	-34%	-10	-35%
RHP 11	43%	50%	18%	7	16%	-32	-65%	-25	-59%
RHP 12	29%	28%	21%	0	-1%	-8	-26%	-8	-27%
RHP 13	23%	43%	28%	20	87%	-15	-36%	5	21%
RHP 14	49%	56%	51%	8	16%	-5	-9%	3	6%
RHP 15	57%	89%	75%	32	56%	-14	-16%	18	31%
RHP 16	61%	83%	64%	22	36%	-19	-23%	3	5%
RHP 17	35%	37%	31%	2	5%	-6	-16%	-4	-12%
RHP 18	38%	69%	40%	31	82%	-29	-42%	2	6%
RHP 19	45%	56%	33%	12	26%	-23	-41%	-12	-26%
RHP 20	57%	61%	57%	4	6%	-4	-6%	0	0%
Mean across RHPs	36%	45%	36%	9	25%	-9	-20%	0	0%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.
**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Centralization. Overall, network centralization increased from T_0 to T_1 and decreased from T_1 to T_2. Even so, across the full Demonstration, centralization increased a total of three percentage points, or 7 percent. At T_0, network centralization for all collaboration across all RHPs was 40 percent (see Table 9). At T_1, network centralization was 49 percent, indicating that the RHPs became more centralized around a few member organizations. From 2013 to 2015, the RHPs, on average, experienced a 14 percent decrease in centralization.

Overall, half of RHPs experienced an increase in network centralization and half experienced a decrease, with many fluctuating up and down across the Demonstrating period. More centralized networks may reflect structures where central organizations serve as hubs for resource and information dissemination, and possibly serve in a broker role between other organizations in the network. Overall and across tie types, the most central organizations tended to be large hospitals or health systems, community mental health centers, or the anchor entity (regardless of their organization type). Table 9 summarizes RHP-level centralization results.

Table 9. Network Centralization by RHP, All Collaboration

NETWORK CENTRALIZATION										
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	52%	59%	44%	7	13%	-16	-26%	-9	-16%
RHP 2	25%	71%	37%	45	179%	-34	-48%	12	46%
RHP 3	36%	81%	63%	45	127%	-18	-23%	27	76%
RHP 4	23%	31%	33%	8	34%	2	7%	10	43%
RHP 5	33%	33%	19%	0	0%	-14	-43%	-14	-43%
RHP 6	32%	74%	49%	42	132%	-24	-33%	18	55%
RHP 7	38%	38%	36%	0	0%	-2	-5%	-2	-5%
RHP 8	50%	50%	40%	0	0%	-10	-20%	-10	-20%
RHP 9	37%	37%	43%	1	1%	6	15%	6	17%
RHP 10	45%	56%	74%	12	26%	18	32%	30	66%
RHP 11	52%	56%	43%	5	9%	-14	-24%	-9	-18%
RHP 12	70%	67%	33%	-3	-4%	-34	-50%	-36	-52%
RHP 13	36%	63%	52%	28	78%	-11	-17%	17	48%
RHP 14	40%	53%	48%	13	32%	-5	-9%	8	19%
RHP 15	38%	14%	29%	-24	-62%	19	133%	-5	-13%
RHP 16	34%	21%	31%	-13	-37%	9	43%	-3	-10%
RHP 17	45%	33%	38%	-11	-26%	4	13%	-7	-16%
RHP 18	22%	39%	33%	17	75%	-6	-14%	11	50%
RHP 19	65%	52%	60%	-14	-21%	9	17%	-5	-7%
RHP 20	19%	52%	38%	33	176%	-14	-27%	19	101%
Mean across RHPs	40%	49%	42%	10	24%	-7	-14%	3	7%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.
**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Average Number of Ties per Organization. The network study also evaluated the mean number of organizational ties, or the average number of collaborative partnerships maintained

by any organization in an RHP. Here the total number of ties an organization has with other organizations in their RHP is measured.

The average number of ties for any given member organization across all RHPs was 5.5 (range: 3.4-10.3) at T_0, 6.7 at T_1 (range: 4.0-10.2), and 5.8 at T_2; see Table 10). These results indicate that at T_0, organizations had an average of 5.5 collaborative partnerships with other organizations in their RHP. By T_1, the average number of collaborations for any one organization had increased to 6.7 and by T_2 the average number had decreased to 5.8. Some RHPs, for example RHP 6, saw an increase in the mean number of organizational ties over the Demonstration period, while others (e.g., RHPs 10 and 12) experienced decreases.

While insightful, comparison of the average number of ties across RHPs should take the total number of organizations in the RHP into account. For example, RHP 20 had a mean of four ties at T_0 but there are only eight organizations participating in that RHP. So there are only seven potential collaborators for any one organization in the RHP. Alternatively, RHP 12 had a mean of 10.3 ties at T_0 but 37 participating organizations, meaning that there are 36 possible collaborations for each organization in the RHP. What is important to take from this measure is that, in more than half of all RHPs, the number of collaborative partnerships increased across the Demonstration period.

Table 10. Average Number of Ties per Organization by RHP, All Collaboration

AVERAGE NUMBER OF TIES PER ORGANIZATION									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	5.2	8.2	6.8	3.0	58%	-1.4	-17%	1.6	31%
RHP 2	5.4	6.0	3.8	0.6	11%	-2.2	-37%	-1.7	-31%
RHP 3	6.3	7.1	9.2	0.7	12%	2.1	29%	2.8	44%
RHP 4	5.0	6.2	4.8	1.3	26%	-1.4	-23%	-0.2	-3%
RHP 5	4.3	5.3	3.0	1.0	24%	-2.3	-43%	-1.3	-29%
RHP 6	5.3	7.3	11.1	1.9	36%	3.9	53%	5.8	108%
RHP 7	4.0	4.0	7.9	0.0	0%	3.9	97%	3.9	97%
RHP 8	4.5	4.5	5.0	0.0	0%	0.5	11%	0.5	11%
RHP 9	5.9	6.8	6.6	0.9	15%	-0.2	-4%	0.6	11%
RHP 10	7.9	7.7	5.6	-0.1	-2%	-2.1	-27%	-2.2	-28%
RHP 11	7.7	8.9	3.2	1.3	16%	-5.8	-65%	-4.5	-59%
RHP 12	10.3	10.2	7.9	-0.1	-1%	-2.3	-22%	-2.4	-23%
RHP 13	4.8	8.6	5.5	3.8	80%	-3.1	-36%	0.8	16%
RHP 14	5.3	6.2	6.2	0.8	16%	0.0	0%	0.8	15%
RHP 15	4.0	6.3	5.5	2.3	56%	-1.0	-16%	1.3	31%
RHP 16	4.9	6.7	5.8	1.8	36%	-0.9	-13%	0.9	19%
RHP 17	6.3	6.6	6.2	0.3	5%	-0.4	-7%	-0.1	-2%
RHP 18	3.4	6.2	3.6	2.8	82%	-2.6	-42%	0.2	6%
RHP 19	5.4	6.8	4.7	1.4	26%	-2.1	-31%	-0.7	-13%
RHP 20	4.0	4.3	4.0	0.3	6%	-0.3	-6%	0.0	0%
Mean across RHPs	5.5	6.7	5.8	1.2	22%	-0.9	-13%	0.3	6%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.
**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Network Diagrams. Network diagrams are used to graphically depict the structure of a network at any single point in time. Figure 1, Figure 2, and Figure 3 include network diagrams to demonstrate the observed change in network structure in RHP 15 at each measured time point: T_0, T_1, and T_2. Organizations in the network diagram are coded by shape *and* color. For example, the gray square with centered lines in Figure 1 represents a community mental health center (indicated by color) that is an IGT entity and performing provider (indicated by the shape), while the pink triangles represent hospitals (indicated by color) that are performing providers only (indicated by the shape). Thus, the diagrams are best viewed in color. RHP 15 was selected as an example for two reasons: 1) the relatively small number of organizations makes the diagram easier to interpret and thus a simpler illustration; and 2) the network changes experienced in this region are easily noticeable in the diagrams.

In this example, there are more ties, shown by lines connecting organizations, present at T_1 than were present at T_0. This represents an increase in network density (from 57% to 89%, see Table 8). There are fewer ties present at T_2 than at T_1, but still more than were present at T_0. One can also use the network diagrams to look at network centralization. At T_0, there were a few organizations that held more central positions in the network, namely the community mental health center, the academic health science center, and one of the hospitals. By T_1, there are fewer organizations maintaining these central positions and this is confirmed with the results presented previously (decrease in network centralization from 38 to 14%; see Table 9). There is more network centralization at T_2 than at T_1. The network diagrams also show that some organizations gained more collaborative partners than others. For instance, the CMHC gained one tie from T_0 to T_1, but already had five existing ties. By T_2, that one new tie was no longer reported as present. One of the hospitals in the RHP had only one tie at T_0, increased to seven ties by T_1, then decreased back to three ties by T_2. Network diagrams for all RHPs are available upon request.
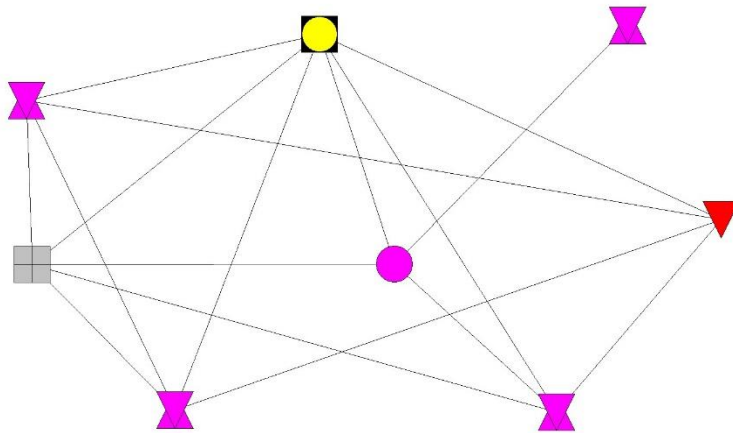
Figure 1. Network Diagram, T_0, RHP 15, All Collaboration

Organization Role in RHP (shape)
◯ Anchor
▢ IGT only
△ IGT + Performing Provider (Hospital)
▦ IGT + Performing Provider (CMHC)
▽ IGT + Performing Provider (Health Department)
◼ IGT + Performing Provider (HSC)
◇ IGT + Performing Provider (Health District)
⧖ Performing Provider only

Organization Type (color)
■ Hospital
■ Hospital / Health District or Hospital Authority
■ County Government
□ City Government
■ School District
■ EMS District
■ CMHC
■ Health Science Center
■ Health Department
■ Physician Practice
■ Health District & Hospital Partnership

Figure 2. Network Diagram, T_1, RHP 15, All Collaboration

Figure 3. Network Diagram, T_2, RHP 15, All Collaboration

Collaboration to Deliver Programs and Services

The second set of results is specific to interorganizational collaboration for delivering programs and services. Qualitative data from the survey provide more specific information about the types of programs and services organizations collaborated to deliver, with several categories commonly cited. Although we do not have data to correlate these collaborations with care outcomes, the data do indicate that much of the reported collaboration was connected to care processes, particularly around continuity of care, patient transfers, and admissions for inpatient care. It is important to note that the information collected consists of notes taken by the interviewer rather than a verbatim transcript of the interview, which does not allow for us to provide direct quotes. Respondents indicated collaborating both formally (via MOUs and referral protocols) and informally to find adequate resources and services for medically indigent patients. Prominent themes included collaborating to get complex patients the behavioral health services they needed, to get patients into different levels of care as needed, and to provide training opportunities for health care professionals (residents, nursing students) in a variety of settings while utilizing those students to expand clinical capacity. The qualitative data indicate that DSRIP helped some informal collaboration related to local mental health needs to become more structured and better resourced. A considerable variety of collaborations were reported across the RHPs at T_0, with additional collaboration focused on DSRIP projects in T_1, and overall, slightly decreased collaboration in programs and services at T_2.

Density. The mean density across RHPs for collaboration to deliver programs and services at T_0 was 33%, indicating that 33% of all possible collaborations around programs and services within the RHP existed (see Table 11). At T_1, the mean overall density was 42%, representing a 25% increase in such ties. By T_2, the mean overall density for program and service delivery ties returned to the pre-Demonstration period density of 33%. There was substantial change across RHPs, however, with eight experiencing a decrease in program and service delivery density and

12 RHPs showing an increase or no change in density (range of percentage change from T_0 to T_2: -54% to 201%; see Table 11). This pattern of an increase between T_0 and T_1, followed by a decrease from T_1 to T_2, resulting in an overall stabilization or slight increase from T_0 to T_2, persists across all measures and tie types.

Table 11. Network Density by RHP, Collaboration to Deliver Programs and Services

NETWORK DENSITY									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	14%	21%	17%	7	51%	-4	-21%	3	20%
RHP 2	32%	35%	18%	4	12%	-17	-48%	-13	-42%
RHP 3	20%	21%	22%	1	5%	2	7%	2	12%
RHP 4	20%	26%	20%	6	32%	-6	-22%	1	3%
RHP 5	43%	68%	43%	25	58%	-25	-37%	0	0%
RHP 6	14%	16%	42%	2	16%	26	160%	28	201%
RHP 7	23%	25%	33%	3	11%	8	32%	11	47%
RHP 8	29%	28%	29%	-1	-3%	1	2%	0	-1%
RHP 9	24%	28%	26%	4	15%	-2	-6%	2	8%
RHP 10	23%	23%	17%	1	3%	-6	-26%	-5	-24%
RHP 11	43%	50%	20%	7	16%	-30	-60%	-23	-54%
RHP 12	28%	28%	19%	0	-1%	-9	-31%	-9	-32%
RHP 13	21%	43%	28%	22	104%	-15	-34%	7	34%
RHP 14	49%	55%	50%	6	12%	-5	-8%	2	3%
RHP 15	57%	89%	61%	32	56%	-29	-32%	4	6%
RHP 16	61%	83%	58%	22	36%	-26	-31%	-3	-5%
RHP 17	33%	33%	30%	0	0%	-3	-10%	-3	-10%
RHP 18	38%	53%	36%	16	41%	-18	-33%	-2	-6%
RHP 19	42%	54%	33%	12	27%	-21	-38%	-9	-21%
RHP 20	57%	57%	57%	0	0%	0	0%	0	0%
Mean across RHPs	33%	42%	33%	8	25%	-9	-21%	0	0%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Centralization. In reference to collaboration to deliver programs and services, network centralization, or the extent to which a network is centralized around a few organizations, also increased from T_0 to T_1 (from 40% to 44% across RHPs; see Table 11) and decreased slightly from T_1 to T_2. There was a 5% increase in network centralization around program and service delivery ties across the Demonstration period. This suggests that, overall, the RHPs are becoming more centralized with respect to delivering programs and services. Changes in network centralization varied across RHPs, from a decrease of 58% to an increase of 124%, with a mean increase of 5% (see Table 12).

Table 12. Network Centralization by RHP, Collaboration to Deliver Programs and Services

NETWORK CENTRALIZATION									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	53%	58%	45%	5	10%	-13	-23%	-8	-16%
RHP 2	28%	73%	36%	45	163%	-38	-51%	8	28%
RHP 3	38%	52%	36%	14	36%	-15	-30%	-2	-4%
RHP 4	24%	22%	32%	-2	-10%	11	49%	8	35%
RHP 5	38%	43%	19%	5	13%	-24	-56%	-19	-50%
RHP 6	22%	37%	50%	14	64%	14	37%	28	124%
RHP 7	28%	32%	33%	5	17%	1	3%	6	21%
RHP 8	51%	51%	40%	1	2%	-11	-21%	-10	-20%
RHP 9	37%	38%	35%	1	1%	-3	-7%	-2	-6%
RHP 10	50%	53%	75%	3	6%	22	42%	25	51%
RHP 11	52%	56%	35%	5	9%	-21	-38%	-17	-32%
RHP 12	70%	68%	30%	-3	-4%	-38	-56%	-41	-58%
RHP 13	38%	63%	57%	26	68%	-6	-9%	20	53%
RHP 14	40%	44%	49%	4	9%	6	13%	9	23%
RHP 15	38%	14%	52%	-24	-62%	38	266%	14	38%
RHP 16	34%	21%	39%	-13	-37%	18	82%	5	15%
RHP 17	44%	32%	34%	-12	-28%	2	6%	-10	-24%
RHP 18	22%	31%	39%	8	38%	8	27%	17	75%
RHP 19	68%	55%	60%	-14	-20%	6	11%	-8	-11%
RHP 20	19%	38%	38%	19	101%	0	0%	19	101%
Mean across RHPs	40%	44%	42%	4	11%	-2	-5%	2	5%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Average Number of Ties per Organization. The average number of ties per organization for delivering programs and services across all RHPs was 5.1 at T_0, 6.2 at T_1, and 5.3 at T_2 (see Table 13). As mentioned, these results indicate the mean number of ties any single organization has around delivering programs and services. The absolute number of ties for each organization in the network is clearly bound by the number of organizations in the RHP; thus the change over time is likely a more meaningful indicator. Some RHPs experienced a decrease or no change in the average number of ties, while others experienced large increases (range of percentage change: -56% to 202%). Again, interpretation of these results should take into account the total number of participating organizations. Table 13 summarizes RHP-level results.

Table 13. Average Number of Ties per Organization, Collaboration to Deliver Programs and Services

AVERAGE NUMBER OF TIES PER ORGANIZATION									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	5.0	7.7	6.5	2.7	54%	-1.2	-16%	1.5	30%
RHP 2	5.1	5.6	2.9	0.6	12%	-2.7	-48%	-2.1	-42%
RHP 3	5.7	6.0	7.1	0.3	5%	1.1	18%	1.4	24%
RHP 4	4.7	6.2	4.9	1.5	32%	-1.4	-22%	0.2	3%
RHP 5	3.0	4.8	3.0	1.8	58%	-1.8	-37%	0.0	0%
RHP 6	3.6	4.2	11.0	0.6	16%	6.7	160%	7.3	202%
RHP 7	3.4	3.8	5.3	0.4	11%	1.5	41%	1.9	57%
RHP 8	4.4	4.3	4.9	-0.1	-3%	0.6	15%	0.5	12%
RHP 9	5.8	6.7	6.3	0.9	15%	-0.4	-6%	0.5	8%
RHP 10	6.6	6.8	5.6	0.2	3%	-1.2	-18%	-1.0	-16%
RHP 11	7.7	8.9	3.4	1.3	16%	-5.6	-62%	-4.3	-56%
RHP 12	10.1	10.0	7.3	-0.1	-1%	-2.7	-27%	-2.8	-28%
RHP 13	4.2	8.6	5.6	4.4	105%	-3.0	-34%	1.4	34%
RHP 14	5.3	6.0	6.0	0.7	13%	0.0	0%	0.7	13%
RHP 15	4.0	6.3	4.3	2.3	56%	-2.0	-32%	0.3	6%
RHP 16	4.9	6.7	5.2	1.8	36%	-1.5	-22%	0.3	6%
RHP 17	5.9	5.9	5.9	0.0	0%	0.0	0%	0.0	0%
RHP 18	3.4	4.8	3.2	1.4	41%	-1.6	-33%	-0.2	-6%
RHP 19	5.1	6.4	4.7	1.3	27%	-1.8	-27%	-0.4	-8%
RHP 20	4.0	4.0	4.0	0.0	0%	0.0	0%	0.0	0%
Mean across RHPs	5.1	6.2	5.3	1.1	21%	-0.8	-14%	0.2	5%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Network Diagrams. Figure 4, Figure 5, and Figure 6 include network diagrams to demonstrate the observed network structure around collaborations to deliver programs and services in RHP 15 at each measured time period. Again, an increase in the number of ties between organizations is observed from T_0 to T_1, while there is a decrease in observed ties from T_1 to T_2. The network appears to be less centralized around a few organizations at T_1 and somewhat more centralized by T_2 (see Table 12 for data supporting this observation). Network diagrams for all RHPs are available upon request.
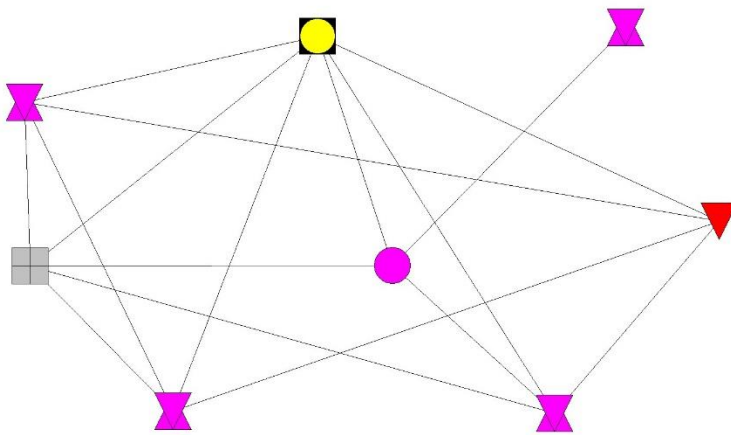
Figure 4. Network Diagram T_0, RHP 15, Collaboration to Deliver Programs and Services

Organization Role in RHP (shape)
- ◯ Anchor
- ▢ IGT only
- △ IGT + Performing Provider (Hospital)
- ⊞ IGT + Performing Provider (CMHC)
- ▽ IGT + Performing Provider (Health Department)
- ▢ IGT + Performing Provider (HSC)
- ◇ IGT + Performing Provider (Health District)
- ⋈ Performing Provider only

Organization Type (color)
- ■ Hospital
- ■ Hospital / Health District or Hospital Authority
- ■ County Government
- ▢ City Government
- ■ School District
- ■ EMS District
- ■ CMHC
- ■ Health Science Center
- ■ Health Department
- ■ Physician Practice
- ■ Health District & Hospital Partnership

Figure 5. Network Diagram T_1, RHP 15, Collaboration to Deliver Programs and Services

Figure 6. Network Diagram T_2, RHP 15, Collaboration to Deliver Programs and Services

Collaboration to Share Tangible Resources

The third section of results is specific to the sharing of tangible resources. Tangible resources could represent financial exchange, but could also entail sharing of support personnel, expertise, facilities and equipment, or other material goods. Qualitative data from the survey provided more specific information about the types of resources shared among organizations in each RHP. The most commonly reported purposes for shared resources were to support:

- Space (for services, to house staff or equipment, to hold meetings)
- Shared staff (crisis intervention, outreach/education workers, specialists, case managers)
- Specific services (medical transportation, screening, billing, labs, data analytics telehealth-based clinical and mental health)
- IGT for DSRIP and UC and
- Materials (vaccines, medical equipment).

Density. Across all RHPs, the mean density for sharing tangible resources at T_0 was 13%, indicating that 13% of all possible relationships existed across RHPs (see Table 14).

At T_1, the mean overall density was 19%, representing a 48% increase in these collaborations; at T_2 the mean overall density was 14%, an increase of 7% across the Demonstration period. Across 16 RHPs, network density for sharing tangible resources increased or remained stable. Five RHPs had a decrease in density (range of percentage change from T_0 to T_2: -80% to 172%). A great deal of resource sharing is represented through relationships where one organization is providing IGT for another organization's DSRIP project (e.g. a community mental health center providing IGT for a hospital's project that would serve people with intellectual or developmental disabilities).

Table 14. Network Density by RHP, Sharing Tangible Resources

NETWORK DENSITY									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	9%	13%	8%	3	34%	-5%	-37%	-1%	-15%
RHP 2	14%	18%	9%	4	31%	-10	-52%	-5	-37%
RHP 3	5%	5%	6%	0	0%	1	11%	1	11%
RHP 4	6%	9%	11%	3	45%	2	23%	5	78%
RHP 5	18%	25%	18%	7	40%	-7	-28%	0	0%
RHP 6	12%	19%	14%	7	55%	-5	-26%	2	15%
RHP 7	10%	14%	18%	4	42%	4	30%	8	84%
RHP 8	8%	10%	15%	2	20%	5	50%	7	81%
RHP 9	9%	10%	11%	1	8%	2	16%	2	26%
RHP 10	6%	7%	8%	1	25%	1	20%	3	51%
RHP 11	6%	8%	9%	1	19%	1	16%	2	38%
RHP 12	7%	9%	9%	2	36%	0	3%	3	41%
RHP 13	7%	16%	10%	10	142%	-7	-41%	3	42%
RHP 14	18%	17%	10%	-2	-8%	-6	-38%	-8	-43%
RHP 15	39%	61%	18%	21	54%	-43	-71%	-21	-54%
RHP 16	14%	56%	38%	42	300%	-18	-32%	24	172%
RHP 17	21%	19%	15%	-2	-9%	-4	-21%	-6	-28%
RHP 18	18%	18%	29%	0	0%	11	62%	11	62%
RHP 19	9%	19%	11%	10	113%	-8	-41%	2	27%
RHP 20	18%	25%	4%	7	40%	-21	-86%	-14	-80%
Mean across RHPs	13%	19%	14%	6	48%	-5	-28%	1	7%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Network Centralization. Similar to collaboration to implement programs and services, there was an overall increase in network centralization related to sharing tangible resources such as office space, transportation services, or staff. From T_0 to T_1, network centralization increased from 31% to 40%, an increase of 29% across all RHPs (see Table 15). By T_2, centralization around tangible resource sharing had decreased to 36%. These results varied considerably by RHP, with eight RHPs experiencing a decrease in centralization, and the remaining 12 seeing an increase. For example, RHP 4 saw an increase of 107% in network centralization, while RHP 19 had a 310% increase in centralization related to sharing tangible resources across the Demonstration.

Table 15. Network Centralization by RHP, Collaboration to Share Tangible Resources

NETWORK CENTRALIZATION									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	43%	35%	21%	-8	-18%	-14	-40%	-22	-50%
RHP 2	20%	36%	40%	16	83%	4	11%	20	102%
RHP 3	31%	17%	24%	-15	-47%	7	44%	-8	-24%
RHP 4	21%	22%	43%	2	8%	21	92%	22	107%
RHP 5	33%	43%	33%	10	29%	-10	-22%	0	0%
RHP 6	24%	83%	30%	59	244%	-53	-64%	6	25%
RHP 7	42%	45%	36%	3	7%	-9	-20%	-6	-15%
RHP 8	13%	27%	43%	13	101%	16	60%	29	220%
RHP 9	31%	30%	22%	-1	-2%	-9	-28%	-9	-30%
RHP 10	20%	26%	54%	6	30%	28	110%	34	172%
RHP 11	30%	16%	34%	-14	-46%	17	107%	4	12%
RHP 12	14%	17%	32%	3	24%	15	88%	18	134%
RHP 13	31%	65%	39%	34	108%	-26	-40%	8	25%
RHP 14	55%	56%	37%	2	3%	-19	-34%	-17	-32%
RHP 15	62%	52%	33%	-10	-15%	-19	-36%	-29	-46%
RHP 16	30%	57%	50%	27	88%	-7	-12%	20	64%
RHP 17	32%	28%	44%	-4	-13%	16	56%	12	35%
RHP 18	33%	19%	19%	-14	-42%	0	0%	-14	-42%
RHP 19	19%	96%	78%	77	405%	-18	-19%	59	310%
RHP 20	33%	24%	14%	-10	-29%	-10	-40%	-19	-57%
Mean across RHPs	31%	40%	36%	9	29%	-3	-9%	5	17%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Average Number of Ties per Organization. The average number of ties per organization related to resource sharing also increased from 1.9 at T_0 to 2.6 at T_1 to 2.3 at T_2 across RHPs (see Table 16). Six RHPs experienced a decrease in the number of collaborative partners, while the fourteen remaining RHPs increased or remained stable. Again, interpretation of these results should take into account the total number of participating organizations.

Table 16. Average Number of Ties per Organization by RHP, Collaboration to Share Tangible Resources

AVERAGE NUMBER OF TIES PER ORGANIZATION									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	3.4	4.6	3.1	1.3	38%	-1.5	-33%	-0.3	-7%
RHP 2	2.2	2.9	1.4	0.7	32%	-1.5	-52%	-0.8	-37%
RHP 3	1.5	1.5	1.9	0.0	0%	0.3	23%	0.3	23%
RHP 4	1.4	2.1	2.6	0.6	44%	0.5	23%	1.1	78%
RHP 5	1.3	1.8	1.3	0.5	40%	-0.5	-29%	0.0	0%
RHP 6	3.2	5.0	3.7	1.8	56%	-1.3	-25%	0.5	16%
RHP 7	1.5	1.1	2.9	-0.4	-25%	1.8	161%	1.4	96%
RHP 8	1.3	1.5	2.6	0.3	20%	1.1	70%	1.3	104%
RHP 9	2.2	2.3	3.2	0.2	7%	0.9	38%	1.0	48%
RHP 10	1.6	2.0	2.7	0.4	25%	0.7	33%	1.1	67%
RHP 11	1.2	1.4	1.6	0.2	18%	0.2	15%	0.4	36%
RHP 12	2.4	3.2	3.5	0.9	36%	0.3	9%	1.2	48%
RHP 13	1.3	3.2	1.9	1.9	143%	-1.3	-41%	0.6	43%
RHP 14	2.0	1.8	1.2	-0.2	-8%	-0.6	-33%	-0.8	-39%
RHP 15	2.6	4.3	1.3	1.7	65%	-3.0	-71%	-1.3	-51%
RHP 16	1.1	4.4	3.4	3.3	300%	-1.0	-23%	2.3	206%
RHP 17	3.8	3.5	3.0	-0.3	-8%	-0.4	-12%	-0.7	-20%
RHP 18	1.6	1.6	2.6	0.0	0%	1.0	63%	1.0	63%
RHP 19	1.1	2.3	1.6	1.2	114%	-0.7	-31%	0.5	49%
RHP 20	1.3	1.8	0.3	0.5	40%	-1.5	-86%	-1.0	-80%
Mean across RHPs	1.9	2.6	2.3	0.7	39%	-0.3	-13%	0.4	21%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Network Diagrams. Figure 7, Figure 8, and Figure 9 include network diagrams to demonstrate the observed network structure around collaboration to share tangible resources in RHP 15 at each measured time point. The diagrams demonstrate that the number of ties between organizations increases from T_0 to T_1; by T_1, all organizations have at least two interorganizational partnerships. However, by T_2, many of those tangible resource sharing ties in RHP 15 are no longer present. Network diagrams for all RHPs are available upon request.
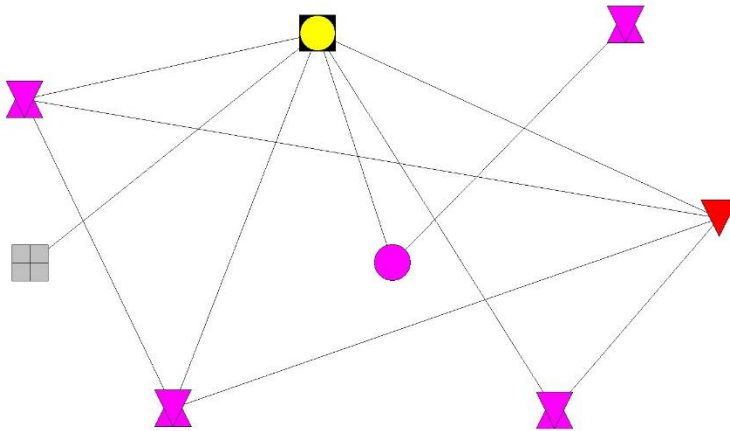
Figure 7. Network Diagram T_0, RHP 15, Collaboration to Share Tangible Resources

Organization Role in RHP (shape)
- ○ Anchor
- □ IGT only
- △ IGT + Performing Provider (Hospital)
- ⊞ IGT + Performing Provider (CMHC)
- ▽ IGT + Performing Provider (Health Department)
- ◙ IGT + Performing Provider (HSC)
- ◇ IGT + Performing Provider (Health District)
- ⧖ Performing Provider only

Organization Type (color)
- ■ Hospital
- ■ Hospital / Health District or Hospital Authority
- ■ County Government
- □ City Government
- ■ School District
- ■ EMS District
- ■ CMHC
- ■ Health Science Center
- ■ Health Department
- ■ Physician Practice
- ■ Health District & Hospital Partnership

Figure 8. Network Diagram T_1, RHP 15, Collaboration to Share Tangible Resources

Figure 9. Network Diagram T_2, RHP 15, Collaboration to
Share Tangible Resources

Collaboration Around Formal Data Sharing

Here network characteristics related to formal data sharing agreements between organizations
are assessed. Data sharing might include formal agreements to transfer patient information
electronically, joint participation in a regional health information exchange, or sharing the same
electronic medical record system within health systems. These new data sharing relationships
functioned largely around ensuring continuity of care for shared patients receiving care from
multiple providers, as well as allowing for analytics to contribute to quality improvement efforts.
Formal data sharing goes beyond individual records for referred patients to actual data
exchange. Respondents indicating formal data sharing agreements were asked for information
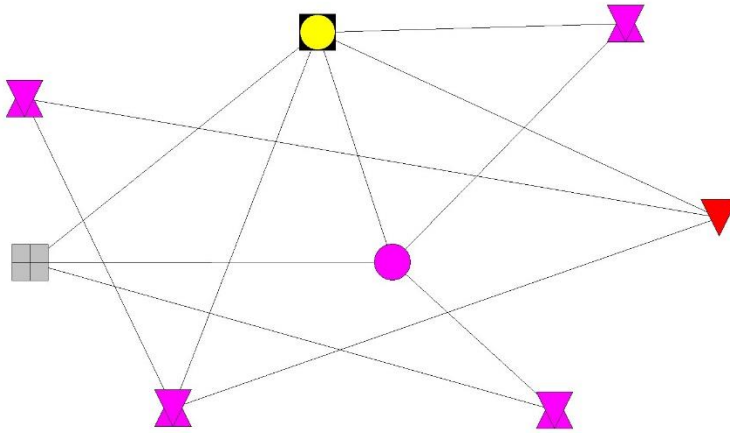about what types of data were shared as well as the directionality of data flow. According to the
respondents, the primary conduits for data sharing were statewide databases and networks,
health information exchanges, or common electronic health record systems. Other formal data
sharing agreements among smaller groupings of organizations consisted of transferring data on
shared patients or patients participating in specific DSRIP projects. Surveillance data were
mentioned by organizations within several RHPs as well, based on mandatory reporting of
infectious diseases. Aggregate data might include disease- or infection-related information
shared between a hospital and a local health department for use in epidemiology research.

Density. The mean density across the RHPs for formal data sharing agreements at T_0 was
10%, indicating that 10% of all possible data sharing relationships existed (see Table 17). At T_1,
the mean overall density increased to 15%, representing a 58% increase in these agreements.
By T_2, the mean overall density decreased slightly from T_1, but an overall increase of 50% from
T_0 was observed. Across RHPs, network density for formal data sharing agreements increased
in all but four RHPs (range of percentage change from T_0 to T_2: -35% to 269%). DSRIP provided
the opportunity to obtain additional resources to support data sharing and the subsequent

creation of local Health Information Exchanges (HIEs) as part of a project. In addition, data sharing enabled organizations to efficiently coordinate activities when serving the same population to ensure no duplication of specific services.

Table 17. Network Density by RHP, Formal Data Sharing Agreements

NETWORK DENSITY									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	3%	4%	5%	1	52%	1	22%	2	85%
RHP 2	6%	7%	11%	2	25%	4	49%	5	86%
RHP 3	10%	13%	8%	3	30%	-5	-38%	-2	-20%
RHP 4	4%	9%	6%	5	135%	-2	-28%	3	70%
RHP 5	18%	29%	21%	11	60%	-7	-25%	4	20%
RHP 6	7%	9%	15%	2	28%	6	63%	8	108%
RHP 7	8%	12%	13%	3	41%	2	13%	5	59%
RHP 8	9%	10%	13%	1	9%	3	31%	4	42%
RHP 9	8%	10%	15%	2	29%	5	49%	7	91%
RHP 10	10%	9%	6%	-1	-12%	-2	-26%	-3	-35%
RHP 11	5%	6%	5%	1	23%	-1	-9%	1	13%
RHP 12	4%	6%	5%	2	63%	0	-7%	2	51%
RHP 13	12%	15%	11%	3	28%	-5	-31%	-1	-12%
RHP 14	12%	12%	10%	0	0%	-2	-15%	-2	-15%
RHP 15	25%	64%	43%	39	157%	-21	-33%	18	72%
RHP 16	8%	25%	11%	17	201%	-14	-56%	3	34%
RHP 17	13%	14%	13%	1	9%	-1	-8%	0	0%
RHP 18	16%	22%	20%	7	42%	-2	-10%	4	28%
RHP 19	1%	17%	5%	15	1185%	-12	-71%	4	269%
RHP 20	14%	11%	50%	-4	-25%	39	367%	36	250%
Mean across RHPs	10%	15%	14%	6	58%	-1	-5%	5	50%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Network Centralization. Typically, information sharing would be examined only at the dyad level; however, it is interesting to look at centralization of data sharing related to DSRIP given the creation of local data exchanges as part of several regions' funded DSRIP projects. There was an overall increase in network centralization related to formal data sharing agreements over the demonstration period. From T_0 to T_1, network centralization increased from 26% to 37%, an increase of 40% across all RHPs, with substantial variation among the RHPs. There was a slight decrease from T_1 to T_2, but an overall increase of 36% across the Demonstration period (see Table 18).

Table 18. Network Centralization by RHP, Formal Data Sharing Agreements

NETWORK CENTRALIZATION									
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	29%	38%	22%	9	31%	-17	-43%	-8	-26%
RHP 2	22%	34%	37%	13	58%	3	8%	15	71%
RHP 3	34%	46%	32%	12	34%	-14	-30%	-2	-7%
RHP 4	14%	18%	16%	4	26%	-2	-11%	2	12%
RHP 5	33%	38%	29%	5	14%	-10	-25%	-5	-14%
RHP 6	34%	32%	38%	-2	-6%	6	20%	4	12%
RHP 7	29%	25%	28%	-4	-13%	3	11%	-1	-4%
RHP 8	28%	19%	52%	-9	-31%	33	171%	24	87%
RHP 9	19%	21%	15%	2	11%	-6	-27%	-4	-19%
RHP 10	23%	20%	63%	-3	-11%	43	210%	40	176%
RHP 11	20%	18%	38%	-1	-7%	19	105%	18	92%
RHP 12	17%	15%	25%	-2	-14%	11	72%	8	48%
RHP 13	26%	72%	60%	46	181%	-11	-16%	35	136%
RHP 14	40%	40%	37%	0	0%	-3	-7%	-3	-7%
RHP 15	24%	29%	38%	5	20%	10	33%	14	60%
RHP 16	21%	96%	42%	75	350%	-55	-57%	20	95%
RHP 17	29%	22%	25%	-8	-26%	3	13%	-5	-16%
RHP 18	36%	28%	31%	-8	-23%	3	10%	-6	-15%
RHP 19	8%	99%	36%	90	1087%	-6	-64%	27	330%
RHP 20	38%	24%	48%	-14	-38%	24	100%	10	25%
Mean across RHPs	26%	37%	35%	10	40%	-1	-3%	9	36%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Average Number of Ties per Organization. The average number of ties per organization related to formal data sharing also increased from 1.4 at T_0 to 2.1 at T_1 and T_2 (see Table 19). Five RHPs experienced a decrease in the number of collaborations while all others had an increase. Again, interpretation of these results should take into account the total number of participating organizations.

Table 19. Average Number of Ties per Organization by RHP, Formal Data Sharing Agreements

AVERAGE NUMBER OF TIES PER ORGANIZATION								
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	1.0	1.5	2.0	0.6	57%	0.4	28%	1.0	100%
RHP 2	0.9	1.2	1.8	0.2	25%	0.6	50%	0.8	87%
RHP 3	2.8	3.7	2.5	0.9	31%	-1.2	-32%	-0.3	-11%
RHP 4	0.9	2.1	1.5	1.2	136%	-0.6	-27%	0.6	73%
RHP 5	1.3	2.0	1.5	0.8	60%	-0.5	-25%	0.3	20%
RHP 6	1.9	2.4	3.9	0.5	28%	1.5	62%	2.0	108%
RHP 7	1.3	1.8	2.1	0.5	40%	0.4	21%	0.9	69%
RHP 8	1.4	1.5	2.2	0.1	9%	0.7	48%	0.8	62%
RHP 9	1.9	2.5	3.7	0.6	29%	1.2	48%	1.8	92%
RHP 10	2.8	2.5	2.0	-0.3	-12%	-0.5	-19%	-0.8	-29%
RHP 11	0.8	1.1	0.1	0.2	25%	-1.0	-91%	-0.7	-89%
RHP 12	1.2	2.1	2.0	0.8	65%	-0.1	-3%	0.8	61%
RHP 13	2.4	3.0	2.1	0.7	28%	-1.0	-31%	-0.3	-12%
RHP 14	1.3	1.3	1.2	0.0	0%	-0.1	-8%	-0.1	-8%
RHP 15	1.8	4.5	3.0	2.8	157%	-1.5	-33%	1.3	71%
RHP 16	0.1	2.0	1.0	1.9	2899%	-1.0	-50%	0.9	1399%
RHP 17	2.3	2.5	2.6	0.2	9%	0.0	2%	0.3	11%
RHP 18	1.4	2.0	1.8	0.6	43%	-0.2	-10%	0.4	29%
RHP 19	0.2	2.0	0.7	1.8	1199%	-1.3	-67%	0.5	333%
RHP 20	1.0	0.8	3.5	-0.3	-25%	2.8	367%	2.5	250%
Mean across RHPs	1.4	2.1	2.1	0.7	48%	-0.1	-3%	0.6	44%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percentage change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Network Diagrams. Figure 10, Figure 11, and Figure 12 include network diagrams to demonstrate the observed network structure around formal data sharing agreements in RHP 15 at each measured time period. The diagrams show that more formal data sharing agreements existed at T_1 and T_2, compared to T_0. There were also two organizations that had no formal data sharing agreements at T_0, but developed at least two agreements by T_1 and maintained them into T_2. Appendix B includes network diagrams for all RHPs.
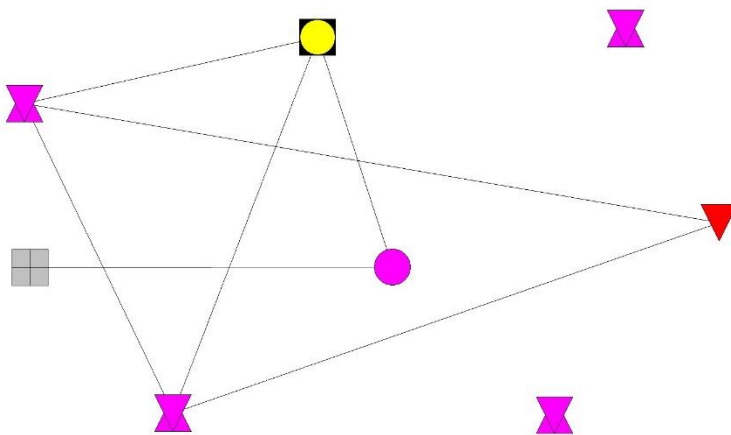
Figure 10. Network Diagram T_0, RHP 15, Formal Data Sharing Agreements

Organization Role in RHP (shape)
- ◯ Anchor
- ☐ IGT only
- △ IGT + Performing Provider (Hospital)
- ⊞ IGT + Performing Provider (CMHC)
- ▽ IGT + Performing Provider (Health Department)
- ⬤ IGT + Performing Provider (HSC)
- ◇ IGT + Performing Provider (Health District)
- ⧖ Performing Provider only

Organization Type (color)
- ▮ Hospital
- ▮ Hospital / Health District or Hospital Authority
- ▮ County Government
- ▯ City Government
- ▮ School District
- ▮ EMS District
- ▮ CMHC
- ▮ Health Science Center
- ▮ Health Department
- ▮ Physician Practice
- ▮ Health District & Hospital Partnership

Figure 11. Network Diagram T_1, RHP 15, Formal Data Sharing Agreements

Figure 12. Network Diagram T_2, RHP 15, Formal Data Sharing Agreements

Network Multiplexity

Multiplexity refers to the strength of relationships between organizations. Organizations that share more than one type of tie are considered to have more complex collaborative partnerships, which are understood to be an indicator of relationship strength. Multiplex ties between organizations suggest stronger relationships because if one of those ties were to erode, others would remain keeping the organizations connected (Provan et al., 2007).

In this study, multiplexity was assessed by adding together the three types of ties described earlier–collaboration to deliver programs and services, sharing tangible resources, and formal data sharing agreements. The descriptive statistic used to represent network multiplexity is the mean number of ties between two organizations. The strength of ties value can only range between one and three (Isett & Provan, 2005). For example, two organizations that work together to deliver programs and services *and* share tangible resources would have two ties, compared with two organizations that only share tangible resources, who would have one tie. In this case, the relationship with two ties would be interpreted as a greater strength of tie than the dyad of organizations with only one.

Statewide, the mean strength of ties between organizations increased slightly from 1.6 at T_0 to 1.7 at T_1, and then to 1.8 at T_2, indicating that on average organizations are experiencing an increase in the complexity of their collaboration with other organizations. Across RHPs, the change from T_0 to T_2 varied, with five RHPs experiencing a slight decrease in tie strength and all others seeing an increase (range of percentage change: -16% to 42%; see Table 20).

Table 20. Strength of Ties by RHP, Mean Strength of Ties between Organizations

STRENGTH OF TIES										
	T_0 (Pre-Waiver)	T_1 (2013)	T_2 (2015)	Change T_0 to T_1		Change T_1 to T_2		Overall Change T_0 to T_2	
				Point Change*	% Change**	Point Change*	% Change**	Point Change*	% Change**
RHP 1	1.8	1.7	1.7	-0.1	-5%	0.0	-1%	-0.1	-7%
RHP 2	1.5	1.6	2.1	0.1	7%	0.5	28%	0.6	37%
RHP 3	1.7	1.8	1.6	0.0	2%	-0.2	-10%	-0.1	-8%
RHP 4	1.4	1.6	1.9	0.2	11%	0.3	18%	0.4	32%
RHP 5	1.7	1.7	1.9	0.0	2%	0.2	13%	0.3	15%
RHP 6	1.7	1.8	1.7	0.1	5%	-0.1	-5%	0.0	0%
RHP 7	1.9	2.0	1.9	0.1	4%	-0.1	-5%	0.0	-1%
RHP 8	1.6	1.6	2.0	0.0	1%	0.4	26%	0.4	27%
RHP 9	1.6	1.7	2.1	0.1	7%	0.4	24%	0.5	32%
RHP 10	1.4	1.5	1.9	0.1	5%	0.4	27%	0.5	34%
RHP 11	1.3	1.3	1.8	0.0	1%	0.5	41%	0.5	42%
RHP 12	1.3	1.5	1.7	0.2	13%	0.2	13%	0.4	27%
RHP 13	1.7	1.8	1.7	0.0	3%	0.0	-2%	0.0	0%
RHP 14	1.6	1.5	1.5	-0.1	-6%	-0.1	-5%	-0.2	-10%
RHP 15	2.1	2.4	1.8	0.3	13%	-0.6	-25%	-0.3	-16%
RHP 16	1.4	2.0	1.8	0.6	44%	-0.2	-11%	0.4	28%
RHP 17	1.9	2.0	2.0	0.1	4%	0.0	-1%	0.0	3%
RHP 18	1.9	1.7	2.1	-0.2	-9%	0.4	23%	0.2	12%
RHP 19	1.2	1.6	1.5	0.4	36%	-0.1	-7%	0.3	27%
RHP 20	1.6	1.6	1.9	0.1	4%	0.3	19%	0.4	24%
Mean across RHPs	1.6	1.7	1.8	0.1	6%	0.1	6%	0.2	13%

*The point change is the percentage point change in the measure across time periods, calculated by subtracting the value of the measure from the furthest time period from the value of the measure from the most recent time period. Due to rounding, not all numbers add precisely.

**The percent change is the change in the measure in the context of the starting point, calculated by dividing the point change over the time period by the value of the measure at the starting time period, e.g. $(T_1-T_0)/T_0$. Due to rounding, not all numbers add precisely.

Network Diagrams. Figure 13, Figure 14, and Figure 15 include network diagrams to demonstrate the changes in tie strength, or multiplexity, in RHP 15 from T_0 to T_1 to T_2. To demonstrate tie strength, the diagrams have thicker lines between organizations with stronger ties. For example, organizations that collaboration to deliver services, share tangible resources, and have a formal data sharing agreement would have the thickest line and organizations only collaborating to delivery services would have the thinnest line. New lines demonstrate new ties between organizations. Network diagrams for all RHPs are available upon request.
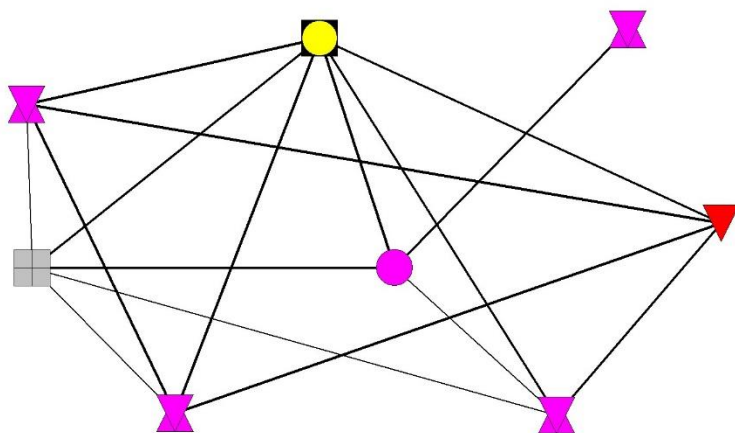
Figure 13. Network Diagram T_0, RHP 15, Mean Strength of Ties between Organizations[1]

Organization Role in RHP (shape)
○ Anchor
□ IGT only
△ IGT + Performing Provider (Hospital)
⊞ IGT + Performing Provider (CMHC)
▽ IGT + Performing Provider (Health Department)
◖ IGT + Performing Provider (HSC)
◇ IGT + Performing Provider (Health District)
⋈ Performing Provider only

Organization Type (color)
■ Hospital
■ Hospital / Health District or Hospital Authority
■ County Government
□ City Government
■ School District
■ EMS District
■ CMHC
■ Health Science Center
■ Health Department
■ Physician Practice
■ Health District & Hospital Partnership

Figure 14. Network Diagram T_1, RHP 15, Mean Strength of Ties between Organizations[1]

Figure 15. Network Diagram T_2, RHP 15, Mean Strength of
Ties between Organizations[1]

[1]Thicker lines represent stronger ties between two organizations.

Attitudes Toward Future Collaboration

To measure the extent to which RHP member organizations recognized the potential for future collaboration with other RHP members, respondents were asked about the likelihood of future collaboration with organizations with whom they did not currently collaborate. Table 21 below demonstrates the summary of responses at each data collection period. Overall, approximately one-quarter of respondents said they may establish new collaborations with other RHP members where collaboration did not currently exist at T_1. This percentage increased to nearly one-third by T_2, suggesting that the regional activities may have raised organizational awareness about other organizations' services, capacity, and resources, as well as the potential to leverage those for addressing community health needs in the future. There was variation across both periods across RHPs. For organizations reporting not seeing potential for collaboration with another organization in their RHP, the overwhelming majority cited that the organization was not within their service area, was a competitor in their market, or that the two organizations' missions were too disparate. In some cases, respondents indicated that they had not heard of the other organization or were not familiar with the organization's work.

Perhaps more interesting were the respondents' comments regarding what future collaboration with other organizations might entail. While many respondents offered a diplomatic and general response of "our organization is open to collaborating with anyone if the right opportunity presents itself that will benefit our clients/patients," others were more specific and focused on the potential for collaboration around crisis intervention/behavioral health services, community-based chronic disease management, coordination around particular populations (i.e., medically

indigent, homeless, children), and facilitating patients'—especially rural patients'—access to necessary specialty care (i.e., cancer care).

Table 21. Potential for Future Collaborations by RHP

	Data Collection Period T₀/T₁		Data Collection Period T₂		
	Yes	No	Yes	No	Change
RHP 1	7%	93%	7%	93%	0%
RHP 2	8%	92%	28%	72%	20%
RHP 3	18%	82%	27%	73%	9%
RHP 4	19%	81%	27%	73%	8%
RHP 5	47%	53%	65%	35%	18%
RHP 6	20%	80%	24%	76%	4%
RHP 7	41%	59%	42%	58%	1%
RHP 8	27%	73%	17%	83%	-10%
RHP 9	17%	83%	18%	82%	1%
RHP 10	21%	79%	22%	78%	1%
RHP 11	13%	87%	34%	66%	21%
RHP 12	13%	87%	18%	82%	5%
RHP 13	17%	83%	25%	75%	8%
RHP 14	44%	56%	26%	74%	-18%
RHP 15	36%	64%	64%	36%	28%
RHP 16	27%	73%	36%	64%	9%
RHP 17	23%	77%	25%	75%	2%
RHP 18	32%	68%	44%	56%	12%
RHP 19	22%	78%	48%	52%	26%
RHP 20	52%	48%	52%	48%	0%
Mean across RHPs	25%	75%	32%	68%	7%

Collaboration with Medicaid Managed Care Organizations

As the Demonstration evolved, HHSC and CMS expressed interest in understanding if and how RHP members, specifically DSRIP providers, were collaborating with Medicaid Managed Care Organizations (MCOs) serving their region. Since the T_2 survey was already planned, a new question related to this collaboration was added. The question asked if there was any collaboration, then asked about the types of collaboration, using the same questions used to ask about other organizations in the RHP. The question was only asked of the survey respondent; MCO representatives were not invited to participate. Responses were analyzed at the RHP-level to determine the percentage of organizations reporting collaboration with MCOs and, of those, the percentage of ties that were around program and service delivery, tangible resource sharing, or formal data sharing. Again, statewide results represent the mean across RHPs.

Approximately 34% of responding organizations indicated that they had a current collaboration with at least one MCO (see Table 22). Of these collaborations, the majority (87%) are related to program and service delivery. For example, some organizations reported that they were working with an MCO on care coordination projects. Other organizations reported that they were having discussions around sustainability planning for maintaining DSRIP project activities post-Demonstration. Fewer collaborations were related to tangible resource sharing (19%), while 43% had formal data sharing agreements with an MCO. On average across RHPs,

organizations have somewhere between one and two types of ties with the MCOs in their region (see Table 22).

Table 22. Collaboration with Medicaid Managed Care Organizations by RHP

	Responding Organizations Reporting Current Collaboration with any MCO	MCO Program and Service Delivery Collaborations*	MCO Tangible Resource Sharing Collaborations*	MCO Formal Data Sharing Collaborations*	Average Tie Strength
RHP 1	29%	100%	11%	67%	1.78
RHP 2	10%	100%	0%	100%	2.00
RHP 3	48%	75%	42%	25%	1.70
RHP 4	31%	100%	0%	40%	1.40
RHP 5	40%	100%	0%	0%	1.00
RHP 6	50%	100%	0%	22%	1.22
RHP 7	55%	67%	17%	33%	1.17
RHP 8	36%	80%	0%	60%	1.40
RHP 9	26%	100%	50%	67%	2.17
RHP 10	24%	100%	29%	43%	1.71
RHP 11	27%	67%	0%	33%	1.00
RHP 12	50%	93%	36%	57%	1.86
RHP 13	18%	100%	0%	33%	1.33
RHP 14	50%	100%	0%	40%	1.40
RHP 15	43%	67%	33%	0%	1.50
RHP 16	43%	100%	0%	0%	1.00
RHP 17	14%	100%	100%	0%	2.00
RHP 18	43%	100%	33%	33%	1.67
RHP 19	8%	0%	0%	100%	1.00
RHP 20	43%	100%	33%	100%	2.33
Mean across RHPs	34%	87%	19%	43%	1.53

*Because organizations can have more than one type of tie, percentages do not add to 100.

When organizations did not report a current collaboration with one or more MCOs, they were asked about the potential for future collaboration. Seventy percent of those responding indicated that future collaboration with an MCO was likely. See Table 23 for RHP-level results.

Table 23. Potential for Future Collaborations with Medicaid Managed Care Organizations by RHP

	Yes	No
RHP 1	43%	57%
RHP 2	43%	57%
RHP 3	69%	31%
RHP 4	70%	30%
RHP 5	100%	0%
RHP 6	83%	17%
RHP 7	100%	0%
RHP 8	86%	14%
RHP 9	88%	13%
RHP 10	73%	27%
RHP 11	75%	25%
RHP 12	50%	50%
RHP 13	62%	38%
RHP 14	20%	80%
RHP 15	100%	0%
RHP 16	100%	0%
RHP 17	92%	8%
RHP 18	75%	25%
RHP 19	67%	33%
RHP 20	0%	100%
Mean across RHPs	70%	30%

Intersectoral Collaborations

Of particular interest is the extent to which DSRIP facilitated increased collaboration among organizations within the RHPs that belong to different sectors. Examination of the current data reveals a few key findings. Across the state, a dramatic increase occurred in ties to community mental health centers by other types of organizations, particularly in the areas of tangible resource sharing and formal data sharing. From a within sector perspective, community mental health centers across the state are inherently connected to one another. Although their service regions are purposefully distinct, regional networks exist, and a statewide database that houses all client data ensures availability of current information on clients regardless of their movement between regions. As the state-supported provider of mental health services, the community mental health centers sometimes serve as the only source of mental health care in a community, especially in rural regions. DSRIP provided an opportunity for communities to focus on behavioral health as well as mobilize new resources by allowing community mental health centers to provide IGT to draw down matching federal dollars for themselves and for other performing providers, which may have encouraged intersectoral collaboration. Across sectors, this increased collaboration is evident both in the number of ties and the increased centrality of these organizations, as well as the strength of their ties.

Another notable finding is the increase in collaboration among organizations that traditionally would not be considered part of the health service delivery system. Increased network ties

across RHPs indicate local governments (cities, counties) and municipal districts (emergency services districts, school districts) as new collaborators within DSRIP. In addition, local public health departments increased their ties regionally, which may be a result of the specific inclusion of public health departments as an eligible performing provider.

Finally, the evaluation findings highlight intersectoral collaboration, not just within the RHPs, but also among other organizations that were not eligible to serve as performing providers. One limitation noted by participants in the initial survey was that they were not asked about other community-based partners they work with but who are not formal participants in the RHP (i.e., they were excluded from the sampling frame for this study). Including these organizations in the sampling frame for each RHP was impossible given the vast number of other organizations that could exist. Instead, the T_2 survey included new questions about other organizational partners. Respondents were asked to list up to three other organizations with which they worked the most on activities to target the underserved populations in their communities. For each new organization listed, the survey included the same questions about types of ties that were asked about RHP member organizations.

A total of 534 additional organizations were reported as key community-based partners. These included non-profit and social service organizations, hospitals either not participating in DSRIP or not in the same RHP, health clinics, law enforcement and criminal justice agencies, behavioral health organizations, federally qualified health centers, county and city governments, school districts, faith-based organizations, health departments, private practice physicians, and academic institutions (see Table 24 for counts within each category). On average, respondents reported at least two other organizations with which they work, and many of those ties were related to program and service delivery (see Table 25).

Table 24. Other Organizational Partners Reported by DSRIP Participants

Categories	# Reported
Non-profit/Social Services Organization	94
Hospital	90
Health Clinic	56
Law Enforcement/Criminal Justice	49
Behavioral Health Organization	48
Federally Qualified Health Center (FQHC)	41
County/Municipality	28
School District	25
Faith-Based Organization	23
Health Department	11
Private Practice	11
Academic Institution	6
Other (e.g. Pharmacy, home healthcare agencies, community health workers, nutrition centers, local nursing homes, community coalitions/collaboratives, Mexican consulate, prescription assistance programs, ambulance transportation services, imaging services for diagnostic work, cities, other RHP, dental clinic, prenatal clinic, consulting group)	52

Table 25. Characteristics of Collaborations with Other Organization Partners

	Total # of Other Organizations Reported	Average # of Other Organizations Reported	Other Organization Program and Service Delivery Collaborations*	Other Organization Tangible Resource Sharing Collaborations*	Other Organization Formal Data Sharing Collaborations*	Average Tie Strength
RHP 1	44	2.6	98%	55%	45%	1.5
RHP 2	18	2.6	94%	67%	61%	1.4
RHP 3	60	2.7	93%	40%	32%	1.8
RHP 4	15	1.9	100%	80%	73%	1.2
RHP 5	11	2.8	100%	27%	45%	1.7
RHP 6	49	2.7	57%	41%	63%	1.9
RHP 7	20	2.5	100%	75%	65%	1.3
RHP 8	30	2.7	93%	47%	43%	1.6
RHP 9	44	2.2	100%	70%	50%	1.4
RHP 10	33	1.7	100%	58%	33%	1.6
RHP 11	15	1.5	100%	53%	40%	1.6
RHP 12	38	2.0	100%	68%	34%	1.5
RHP 13	38	2.5	50%	29%	63%	2.1
RHP 14	17	2.1	24%	35%	59%	2.6
RHP 15	17	2.4	71%	12%	35%	2.6
RHP 16	12	1.4	92%	58%	17%	1.8
RHP 17	31	2.4	97%	55%	45%	1.5
RHP 18	12	2.4	100%	42%	50%	1.6
RHP 19	15	2.1	100%	87%	33%	1.4
RHP 20	15	3.0	100%	33%	53%	1.6
Statewide	**534**	**2.3**	**88**%	**52**%	**47**%	**1.6**

*Because organizations can have more than one type of tie, percentages do not add to 100.

CONCLUSIONS

Evaluation Goal 9 examines the extent to which the establishment of RHPs increased collaboration among health care organizations and stakeholders in each region. The analysis of the interorganizational network data collected to assess Evaluation Goal 9 suggests several key changes in collaboration from prior to implementation of the Demonstration to 2015.

Across the RHPs, network density, centralization, and the mean number of ties for any one organization increased from T_0 to T_1 and decreased from T_1 to T_2, but varied considerably across the type of tie considered, as well as by RHP.

The overall change in network density from T_0 to T_1 followed the hypothesis that density would increase, as networks are generally expected to develop over time. Most RHPs saw an increase in the number of collaborative relationships following the creation of the RHPs. According to survey respondents, the DSRIP program catalyzed new collaborations around projects. For the regions that experienced a decrease or stabilization of density from T_0 to T_1, it may be because they already had high levels of network density at T_0, or that the kinds of collaborations supported by DSRIP led organizations to work more closely with specific types of providers rather than others.

While most RHPs saw an increase in network density, there was variation among them. Because the RHPs were mandated partnerships, RHPs varied with regard to existing collaborative relationships among organizations. This explains some of the variation; where networks had relatively higher density to begin with, they had relatively less opportunity for dramatic increases in number of ties, and may have experienced stability or only slight increases in density following DSRIP. For example, decreases in resource sharing may stem from organizations' need to use their resources to support DSRIP projects, which may have diverted them from previous collaborations. Conversely, RHPs with lower starting density had more opportunity for substantial changes in total number of ties and network density as implementation progressed.

From T_1 to T_2, network density decreased across the state, resulting in an overall stabilization or slight increase from T_0. These results did vary by RHP and by tie type. Several factors likely contributed to this phenomenon. In the time between T_1 and T_2, providers who determined that their DSRIP projects were not going to be viable were allowed to withdraw them without penalty. Thus, performing providers in some RHPs ultimately withdrew their DSRIP project(s). These providers remained in the sampling frame for the evaluation to understand the impact of these changes. After the initial inflow of Demonstration Year 1 resources that many organizations used to start up their projects, some performing providers may have realized the resource intensive nature of their projects, the administrative burden of DSRIP, and the necessity to focus their time and attention on meeting their own metrics to be able to obtain payment. As stated by one organization:

> The number of emails and deliverables…outside the services and everything—there's not enough bandwidth to collaborate with more people and figure out processes. We are really tied up with the number of requirements to keep up with.

Other methodological factors that may have contributed to the witnessed decrease in collaboration from T_1 to T_2 include a larger sample in T_2 (and thus larger denominator), an overall lower response rate in T_2, as well as a change in the types of respondents selected by each organization to participate in the survey. When data were collected for T_0/T_1, the DSRIP projects were not yet completely operational as the Demonstration was still relatively young, and organizations typically selected an executive-level staff member to take the survey on behalf of the organization. At T_2, the projects were well underway, and many of the organizations designated one of the DSRIP project managers as their respondent. In cases of larger organizations, the project manager may not have been as familiar with the organization's collaborations outside of DSRIP as the executive who answered in the first round of data collection. Thus, some existing relationships may have gone unreported.

The existing relationships among organizations in the RHPs varied in terms of centralization as well. In some regions, collaborations were highly centralized, with one or two organizations serving as the focal point of collaboration, while others were decentralized with multiple organizations sharing in that role. The state of these networks prior to the formalization of the RHPs explains some of the variation in changes following DSRIP implementation. From T_0 to T_1, the state witnessed an increase in network centralization; this change was dramatic in some of the regions that were previously decentralized as they added the role of an anchor institution or key IGT entities. In other regions that were already fairly centralized, the changes were not as great, and still other RHPs that began as highly centralized actually saw decreases in centralization as other organizations penetrated those networks' collaborative activities.

From T_1 to T_2, centralization followed a similar pattern to density, decreasing statewide but resulting in an overall slight increase. This may be partially attributed to the withdrawal of DSRIP projects and resulting loss of some linkages between organizations. The net increase over time, however, may hinge on one or very few large IGT providers emerging in a region, typically large public hospitals/hospital districts. More centralized RHPs may indicate efficiency in disseminating information and resources throughout the network, but those networks may not be as equitable as those with a more decentralized structure and higher network density.

While statewide network measures consistently experienced substantial increases from T_0 to T_1 followed by decreases between T_1 and T_2, the largest increase in density, centrality, and total number of ties related to formal data sharing. The substantial increases in formal data sharing derive from a few key factors. First, formal data sharing was low within all regions prior to the establishment of the RHPs, which provided much room for growth. Second, the nature of the projects supported by the Demonstration either necessitated or encouraged data sharing among members to ensure coordination and continuity of services between organizations. Finally, several of the RHPs took advantage of resources available through DSRIP projects to establish local or regional HIEs.

Although overall collaboration from T_0 to T_2 was stable or increased slightly, the surge in collaboration witnessed at T_1 and around key ties such as formal data sharing agreements are still important to acknowledge. As new organizations were introduced to their RHPs, the dramatic increase in interorganizational ties has value beyond DSRIP, particularly in the context of strengthening existing ties.

Although the overall increase in network density was slight from T_0 to T_2, the strength of ties between organizations increased consistently over the same time period. Between T_0 and T_1, the collaborative relationships among organizations increased overall across the state. The accompanying modest increase in tie strength suggests that organizations that already had collaborative relationships in place prior to the establishment of the RHPs generally did not change the nature of their relationships as part of Demonstration implementation. That is, in general, there was a greater increase in new relationships compared to strengthening of existing relationships. However, between T_1 and T_2, networks that saw overall decreases in density continued to see modest increases in tie strength. This may indicate that while networks lost ties overall from T_1 to T_2, ties were gained between organizations that were already collaborating in at least one way. This finding suggests that, at least for some organizations participating in the RHPs, partnerships have strengthened over the Demonstration period. Stronger partnerships, as measured by the number of ways in which organizations are collaborating, indicate the potential for longevity in collaboration since the loss of one tie type (e.g., tangible resource sharing) does not lead to complete loss of the partnership. For the RHPs, this may mean that partnerships developed or maintained throughout the Demonstration period are sustainable.

Except for multiplexity, across network measures overall, the evaluation revealed an increase between T_0 and T_1 and slight decrease between T_1 and T_2. Several factors should be considered in understanding these results. First, the initiation of DSRIP incentivized early experimentation, as well as substantial enthusiasm about collaboration within regions. There was an early surge of collaborations linked to organizations getting their DSRIP projects to be fully operational. Over time, the pressure of meeting metrics and responding to required monitoring reduced the resources available for collaboration; organizations recalibrated their efforts to focus on meeting their metrics in order to receive payments. Given the changes and constraints encountered during implementation of the Demonstration, the projects that ultimately survived were those that organizations implemented primarily on their own.

In summary, the Demonstration and establishment of the RHPs did increase collaboration among stakeholders in each region. Evaluation Goal 9 resulted in the following findings:

- The formation of the RHPs led to increased network density in the early stages of Demonstration implementation. Observed increases did not persist, in aggregate, throughout the full Demonstration period, although the results vary by RHP and type of collaboration. The density of formal data sharing ties increased by 5 percentage points across the Demonstration period, compared to no increase in program and service delivery ties among DSRIP performing providers. These findings demonstrate that organizations participating in the RHPs invested more in developing new tangible resource and data sharing ties than program and service delivery ties. It is possible that tangible resource and data sharing partnerships were more beneficial for supporting DSRIP projects than a less formal service delivery tie. Even so, the assessment of other organizations with which DSRIP participants collaborated indicate that non-DSRIP providers were key partners in DSRIP implementation.
- The formation of the RHPs led to increases in network centralization over time, in general and across all tie types. The largest increase in network centralization was for formal data sharing ties (nine percentage points). Centralization, across all RHPs, was

highest for program and service delivery, but over time formal data sharing networks became almost as centralized. This is important since data sharing may be a key component for patient care coordination across providers and geographies and a more centralized network may indicate technical and practical efficiency in data sharing.

- The formation of RHPs led to an increase in network multiplexity, or strength, over time. An overall 13 percent increase (0.2 point increase) in multiplexity was observed. These findings may suggest the potential for sustainability of partnerships created or maintained throughout the Demonstration, even beyond the funding period.
- The formation of the RHPs led to more intersectoral ties over time, both within the defined RHP network and with external partners. Intersectoral ties were observed in all RHPs and for all tie types. The inclusion of community mental health centers, public health departments, and other non-traditional service delivery organizations, such as school districts as eligible DSRIP providers expanded the potential for intersectoral collaboration that may be necessary for comprehensive care delivery to the state's most vulnerable populations.

LIMITATIONS

This report provides an analysis of changes in the collaborative relationships among organizations within each RHP and across the state as a whole. In considering these findings, it is important to acknowledge several limitations of the data.

First, the surveys were completed (in most cases) by one respondent per organization. Although the anchor institutions worked with the organizations directly to identify the appropriate respondent who would be knowledgeable of the relationships asked about in the survey, it is improbable that one person would know all of the collaborative activities happening across an organization—particularly for the larger organizations. In addition, the types of respondents changed for the second round of data collection. Differences in institutional knowledge between executives who responded T_0/T_1 versus project managers at T_2, likely affected the extensiveness of the relationships reported.

Some organizations mitigated this issue by having several people participate in the phone call when the survey was administered. In other cases, respondents answered "I don't know" to certain questions, and the evaluation team followed up by email to give them a chance to find the right information. In a few cases, extraordinary turnover within organizations resulted in a significant loss of institutional memory, and the historical relationships remained unknown (and show in the data as no relationship). Consequently, the data should be interpreted as likely under-representing the relationships that actually exist, which means the conclusions are very conservative in that respect.

Second, a 100% response rate was not achieved. For network analysis, a 100% response rate is ideal because it allows for confirmation of relationships and analysis of directionality within a relationship. This sample had an overall response rate of 84% during data collection for T_0/T_1 and 76% during data collection for T_2, both of which are acceptable within the existing literature. The analysis accommodates the unconfirmed relationships by symmetrizing the data, meaning that if one organization reported collaborating with another organization, it is treated as a

confirmed relationship (i.e., the relationship was identified by both organizations). Since a 100% response rate was not attained in every RHP, there are missing data within some of the RHPs. Lack of a tie between two organizations could be misleading if neither organization participated in the survey, as a tie could exist but was not documented. Further, the lower response rate for T_2 data collection could artificially show a decrease in outcome measures in some RHPs where relationships did not end but, rather, were not reported.

Third, the evaluation design used in this study is limited by not having a comparison or control group, which would improve internal validity of the study. Without a comparison group, we are unable to assess causality or attribute any observed change to the Demonstration specifically. While a control group design is preferred, it should be noted that there were no available controls (e.g. geographic, service delivery focused networks of healthcare providers and public funding entities that were not participating in the Demonstration) to include in the study.

A fourth limitation, as emphasized by survey respondents, is that the sampling frame did not include other organizations that may have been key collaborators in DSRIP activities. At T_0/T_1, the evaluation team learned from respondents that there were other collaborations occurring that were significant in DSRIP but not captured through the survey because these collaborations were with organizations that were not eligible to serve as performing providers in DSRIP. To account for this, the evaluation team added a set of questions in the T_2 survey asking respondents to name up to three additional organizations with whom they had collaborations. This information provides valuable insight, but we do not have corresponding data from T_0/T_1 to be able to assess changes.

A final limitation is related to understanding the impact of a mandated network on network effectiveness. The RHPs can be characterized as mandated partnerships since external forces (namely, HHSC) required their creation. Given the design of the evaluation and the lack of control or comparison networks that were not mandated, it is unclear how the network mandate impacted network characteristics or effectiveness. In addition, the RHPs entailed some partnerships that predate the Demonstration, and thus not every relationship was formed by mandate, which complicates our understanding. Even with this limitation, Evaluation Goal 9 provides important insights. The network findings suggest that partnerships maintained throughout and developed during the Demonstration may be sustainable beyond the Demonstration and, without incentive to participate in the RHPs, may not otherwise exist or persist.

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NETWORK DIAGRAMS

Network diagrams for each RHP at each time period for each tie type are available upon request. Each page includes a graphical demonstration of the RHP network for a single ties type across each of the three study periods.

INSTRUMENTS

INTERORGANIZATIONAL NETWORK SURVEY, T_0/T_1 INSTRUMENT

[SCRIPT] Thank you for agreeing to participate in our Interorganizational Network Survey! The purpose of the survey is to understand how the development of the Regional Healthcare Partnerships for implementation of the 1115 Medicaid Waiver affects relationships among organizations within the region.

As a representative of your organization, you are being asked participate in this survey because your organization is participating in the 1115 Medicaid Waiver through your Regional Healthcare Partnership.

You received a copy of the Information Sheet in your original recruitment email. Would you like for me to review the information? Did you have any questions about the information provided?

Do you have any questions before we get started?

I am going to ask you a series of questions about your organization's interactions with a few other organizations within your region. When I mention collaboration, I am specifically interested in collaboration that focuses on serving the low-income or medically indigent population in your community.

If you are unsure about the answer to any question, you can tell me that you do not know the answer. At that point I will ask you for another individual at your organization that we can contact for more information.

I am going to read a list of X organizations that are part of your Regional Healthcare Partnership. Please indicate your response to the question with a "yes" or a "no".

Does [Organization X] currently work with [LIST OF ORGS] on activities that target improved access or services for the underserved? Yes or No or I don't know

   [For the "Yes" Organizations:]

[If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

In the past 12 months, has [Organization X] collaborated with [Organization Y] to deliver programs or services? Yes or No or I don't know

   [If yes:] What programs or services?

   [If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

In the past 12 months, has [Organization X] shared tangible resources with [Organization Y] for the purpose of increasing access to services? Yes or No or I don't know

[If yes:] What were those resources intended to support?

[If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

Does [Organization X] currently have a formal data sharing agreement with [Organization Y]? Yes or No or I don't know

[If yes:] What data is shared? Do they provide data to you, do you provide data to them, or both?

[If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

[If no to all three:] You answered no to the last three questions but indicated that you do work with [Organization Y]. Can you tell me a little about what you do with them?

[REPEAT SET OF QUESTIONS FOR ALL "YES" ORGANIZATIONS.]

[SCRIPT] Now I am going to ask you some questions about the organizations you said [Organization X] does not currently collaborate with.

[For the "No" organizations:]

Is [Organization Y] an organization [Organization X] is likely to collaborate with in the future on activities that target improved access or services for the underserved? Yes or no or I don't know

[If yes:] What would you envision the collaboration involving?

[If no:] Can you tell me more about that?

[If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

[Once through all:]

[SCRIPT] Now that we have discussed your current relationships with these organizations, I would like to ask you about these relationships before [Regional Healthcare Partnership #] was established.

I am going to read the same list of organizations from your RHP. Please indicate your response with a "yes" or a "no":

Prior to the establishment of [RHP #], did [Organization X] work with [LIST OF ORGS] on activities that target improved access or services for the underserved? Yes or No or I don't know

[For the "Yes" Organizations]

[If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

Prior to the establishment of RHP #, did [Organization X] collaborate with [Organization Y] to deliver programs or services? Yes or No or I don't know

> [If yes:] What programs or services?
>
> [If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

Prior to the establishment of RHP #, has [Organization X] shared tangible resources with [Organization Y] for the purpose of increasing access to services? Yes or No or I don't know

> [If yes:] What were those resources intended to support?
>
> [If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

Prior to the establishment of RHP #, did [Organization X] have a data sharing agreement with [Organization Y]? Yes or No or I don't know

> [If yes:] What data is shared? Do they provide data to you, do you provide data to them, or both?
>
> [If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

[If no to all three previous questions:] Can you tell me how [Organization X] worked with [Organization Y] prior to the establishment of RHP #?

[REPEAT SET OF QUESTIONS FOR ALL "YES" ORGANIZATIONS.]

[SCRIPT] Thank you for participating in this survey!

INTERORGANIZATIONAL NETWORK SURVEY, T₂ INSTRUMENT

INTRODUCTION

[SCRIPT] Thank you for agreeing to participate in our Interorganizational Network Survey! The purpose of the survey is to understand how the development of the Regional Healthcare Partnerships for implementation of the 1115 Medicaid Waiver affects relationships among organizations within the region.

As a representative of your organization, you are being asked participate in this survey because your organization is participating in the 1115 Medicaid Waiver through your Regional Healthcare Partnership.

You received a copy of the Information Sheet in your original recruitment email. Would you like for me to review the information? Did you have any questions about the information provided?

Do you have any questions before we get started?

I am going to ask you a series of questions about your organization's interactions with a few other organizations within your region. When I mention collaboration, I am specifically interested in collaboration that focuses on serving the low-income or medically indigent population in your community.

If you are unsure about the answer to any question, you can tell me that you do not know the answer. At that point I will ask you for another individual at your organization that we can contact for more information.

SECTION I – T2 COLLABORATION NETWORK SURVEY

[SCRIPT] I am going to read a list of [X] organizations that are part of your Regional Healthcare Partnership. Please indicate your response to the question with a "yes" or a "no".

Does [Organization X] currently work with [LIST OF ORGS] on activities that target improved access or services for the underserved? Yes or No or I don't know

[SCRIPT] Some of the feedback we received when we conducted this survey previously was that by only including RHP member organizations participating in DSRIP, we were missing information about collaboration with other important partners.

Other than the organizations I've asked you about, can you tell me the names of up to 3 other organizations with which you work the most on activities that target improved access or services for the underserved? [Open-ended with three boxes – these will pre-populate follow-up questions so we are asking the same questions about these new orgs as we are those orgs already in our list].

[Follow-up question for each organization] Can you tell me what kind of organization that is?

[For the "Yes" Organizations and for each of the other organizations listed by respondent:]

[If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

In the past 12 months, has [Organization X] collaborated with [Organization Y] to deliver programs or services? Yes or No or I don't know

> [If yes:] What programs or services?

> [If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

In the past 12 months, has [Organization X] shared tangible resources with [Organization Y] for the purpose of increasing access to services? Yes or No or I don't know

> [If yes:] What were those resources intended to support?

> [If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

Does [Organization X] currently have a formal data sharing agreement with [Organization Y]? Yes or No or I don't know

> [If yes:] What data is shared? Do they provide data to you, do you provide data to them, or both?

> [If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

[If no to all three:] You answered no to the last three questions but indicated that you do work with [Organization Y]. Can you tell me a little about what you do with them?

[REPEAT SET OF QUESTIONS FOR ALL "YES" ORGANIZATIONS.]

[SCRIPT] Now I am going to ask you some questions about the organizations you said [Organization X] does not currently collaborate with.

[For the "No" organizations:]

Is [Organization Y] an organization [Organization X] is likely to collaborate with in the future on activities that target improved access or services for the underserved? Yes or no or I don't know

[If yes:] What would you envision the collaboration involving?

[If no:] Can you tell me more about that?

[If "I don't know":] Can you give me the name of someone else at your organization that we may contact to learn about these relationships?

[REPEAT SET OF QUESTIONS FOR ALL "NO" ORGANIZATIONS. Once through all move to Section II]

SECTION II: UNCOMPENSATED CARE AND CHANGES IN ACCESS

[SCRIPT] We've been talking about your organization's collaborative activities related to DSRIP but I'd like to shift the focus slightly and discuss changes in access to care brought about by the change in the Uncompensated Care program.

Are you familiar with the changes to Uncompensated Care as part of the Waiver Program? Yes or No

[If "No," move to the end of the survey]

[For those responding "Yes"]

[SCRIPT] Ok, now I'd like to ask you a question about the effect of changes in the Uncompensated Care program associated with the 1115 Waiver Program on access to care in your community.

[If "Yes":] To the extent that you can, think about the uncompensated care program as distinct from ACA or other changes affecting health insurance coverage in general. Overall, would you say that the changes in uncompensated care payment associated with the 1115 Waiver Program Improved access to care for the underserved within your organization's service area, Reduced access, or Had no meaningful impact on access to care?

[Follow-up:] Can you tell me more about that? (Interviewer can provide clarifying questions such as: how do you think the changes in UC led to improved/reduced access, why do you think there was no impact) [OPEN ENDED]

[SCRIPT] This concludes the survey, thank you for your participation!

APPENDIX D:
STAKEHOLDERS' PERCEPTIONS & RECOMMENDATIONS

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BACKGROUND FOR EVALUATION GOALS 10 AND 11

The Texas Healthcare Transformation and Quality Improvement Waiver Program (Demonstration), created through an 1115 waiver, aims to improve access to health care, increase quality of care, and reduce costs of care by expanding Medicaid Managed Care, revising the Uncompensated Care (UC) system, and creating a Delivery System Reform Incentive Payment (DSRIP) pool. Given the geographic vastness of the State of Texas, as well as the diversity of the populations in different areas of the state, the Texas Health and Human Services Commission (HHSC) elected to implement the UC and DSRIP portions of the Demonstration by facilitating the creation of Regional Healthcare Partnerships (RHPs). The RHPs serve as a mechanism to plan, implement, and track DSRIP projects. In many cases, the counties and subsequent agencies and providers comprising these RHPs have worked together previously in varying capacities; however, as the RHP regions do not reflect exact boundaries of other service region designations (e.g., Department of Family Protective Services regions, Department of State Health Services regions, Health & Human Service regions, education service regions, etc.), new stakeholders were likely introduced as well.

Twenty RHPs comprised of all Texas counties serve as the structure for implementing the Demonstration. These partnerships were formed between March and June 2012. Early in 2012, there were few documented guidelines or processes for Demonstration implementation, so new information was being released by HHSC on a weekly if not daily basis. The early guidance for establishment of the RHPs was that they had to be contiguous counties and that the boundaries have some justifiable basis in historic patient flow. HHSC released a preliminary map suggesting what RHP boundaries might look like and asked the stakeholders across the state to modify and revise as needed.

In some cases, the RHPs came together fairly quickly based on historical relationships among counties and organizations within them—particularly those who were eligible to provide Intergovernmental transfers (IGT) and serve as an anchor institution. In other regions, politics around community composition, concomitant resources, and power caused the negotiation of RHP boundaries to take longer. Throughout the formation of the RHPs, different state-level associations for specific constituency groups offered varying (and fluid) opinions on what their members should do. Ultimately, RHPs formed based on HHSC review and consideration of stakeholders' comments submitted through surveys, emails, and meetings. An RHP map illustrates the boundaries in Figure 1 below.
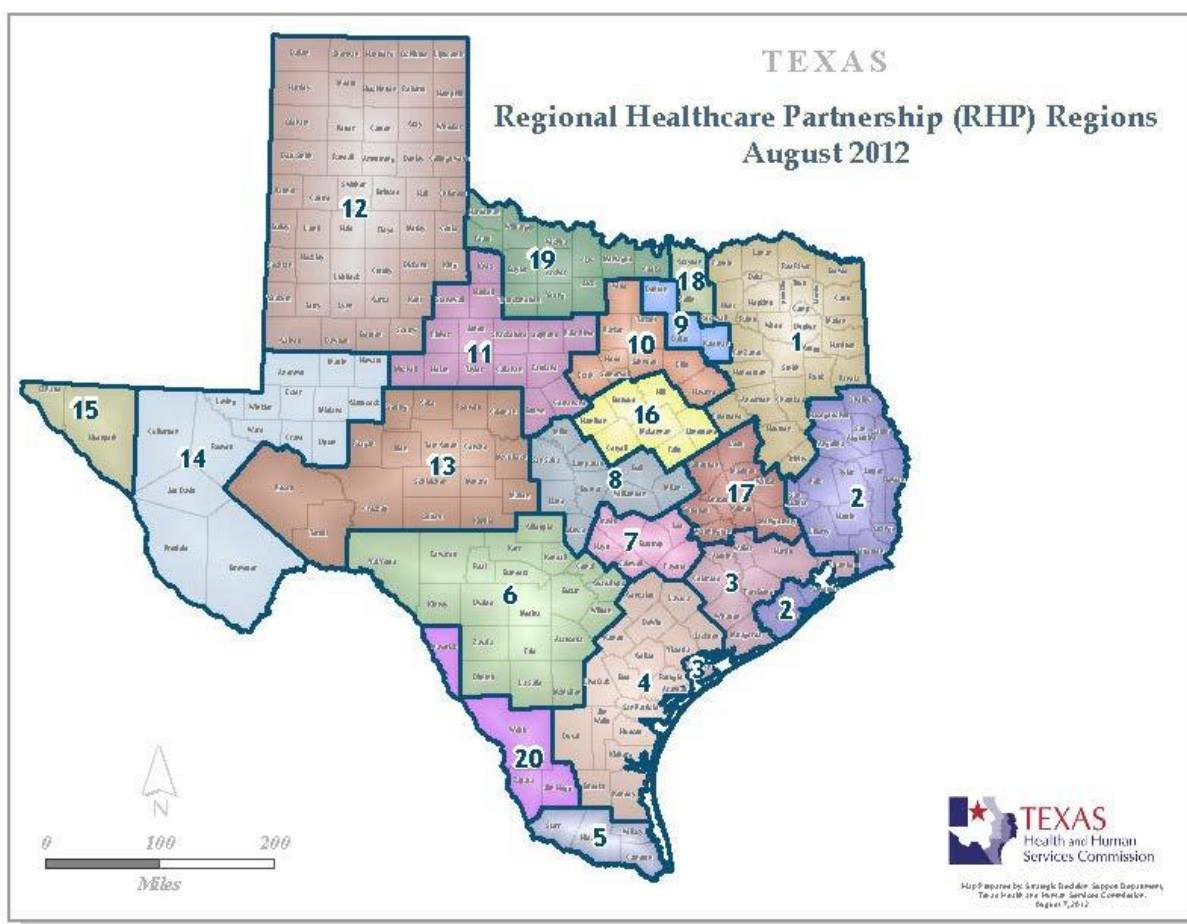
Figure 1. Map of Regional Healthcare Partnerships

The initial formation of each RHP also included designation of an anchor institution, the organization responsible for the administrative coordination of the region and the primary interface with HHSC—also a political issue in several regions. If an RHP had a public hospital, it was the primary organization considered for the anchor role, followed by hospital districts or health districts, public health departments, and academic health science centers.

Political issues as challenges for RHP formation:

- Designation of anchor institution
- County/hospital district as indigent care provider
- Unclear and changing guidance from state and federal government entities

Several basic structures are similar across RHPs, but beyond that, there is great variability. Across the state, each RHP has an anchor institution, and RHP membership includes organizations participating in UC and/or DSRIP. In some RHPs, those are the only recognized members; in others, organizations not participating (or not eligible to participate directly) in UC or DSRIP but that have an interest in the activities of the partnership are also included as members. The RHPs' governance structures range in size and formality as well. With no specific guidelines or requirements regarding governance, the RHPs were able to tailor their structure to

the needs and expectations of their members. Some RHPs took a formal approach, developing bylaws and governance policies and decision-making processes. Some appointed a governance committee (i.e., steering committee or executive committee). At the other end of the continuum are RHPs in which organizational members operate independently except to meet mandatory requirements of HHSC or CMS. The design of funding flow allows for each of these models, as each performing provider is required to document their milestones in order to request IGT; the transfer is then made by the entity who committed it, and the drawdown from CMS comes directly to the performing provider. Thus, the funds are not centralized or pooled at the RHP level as part of the process. The anchor institution for each RHP serves as the administrative entity to coordinate members' compliance with required documentation and reporting, but does not manage the financial transactions of the IGT entities or performing providers.

Table 1. Key Terms and Definitions

Key term	Definition
Anchor	Administrative organization tasked with coordination of RHP activities and reporting. The anchor must be a public hospital, hospital district, hospital authority, county, or public university with an academic health science center.
DSRIP Category 1	Portion of the DSRIP menu containing infrastructure-based projects from which performing providers choose.
DSRIP Category 2	Portion of the DSRIP menu containing program/service-based projects from which performing providers could choose.
DSRIP Category 3	Portion of the DSRIP menu containing outcome measures and metrics that each Category 1 or 2 project was required to have accompanying it in the RHP plan.
DSRIP Category 4	Portion of the DSRIP menu outlining population health measures (e.g., potentially preventable hospitalizations) that performing providers, particularly hospitals, were required to report.
Intergovernmental transfer (IGT)	Providers or entities, such as cities, counties, hospital districts, hospital authorities, and academic health science centers that have public funds eligible to use as state match under the waiver.
Learning collaborative	A regional approach to quality improvement. All RHPs were required to organize and implement a learning collaborative unless the RHP was designated as a Tier 4 RHP.
Other stakeholders	Organizations that do not formally participate in UC, DSRIP, or Medicaid Managed Care but have a stake or interest in the outcomes of the Demonstration.
Regional Healthcare Partnership (RHP)	Locally-developed confederations. The RHPs serve as a mechanism to plan, implement, and track DSRIP projects and UC payments.
Performing providers	Organizations that participate DSRIP and receive payment for DSRIP projects. Eligible performing provider organizations included public and private hospitals, hospital or health districts, community mental health centers, academic health science centers, public health departments, and physician practices.
RHP member	An organization that formally participates in a RHP through UC or DSRIP.

General Literature Review

Community partnerships are an increasingly common mechanism for pooling financial, human, social and political capital to improve health (Wendel, Burdine, & McLeroy, 2009). As community partnerships evolve, they frequently develop more complex organizational structures to facilitate planning, decision making, and implementation of activities (Butterfoss, Goodman, & Wandersman, 1993; Butterfoss & Kegler, 2002; Goodman et al., 1998; McLeroy, Kegler,

Steckler, Burdine, & Wisotzky, 1994). Examples of more complex organizational structures include formal policies and processes for the partnership, such as bylaws and subcommittee structures, as well as clear guidelines for how decisions are made and how conflict is addressed (Florin, Mitchell, Stevenson, & Klein, 2000). Role clarity also increases as partnerships develop, with specific responsibilities for leadership and partnership functions. Expected outcomes from more complex organizational structures include increased collaboration or capacity for collaboration to coordinate activities and deliver services more efficiently (Chaskin, 2001; Goodman et al., 1998; Kegler, Twiss, & Look, 2000; Wendel et al., 2009).

There is considerable variability in the way community partnerships are established, their composition, how they fulfill key functions, and how they are sustained over time (Butterfoss & Kegler, 2002). The complexity and broad range of approaches present substantial challenges for evaluating partnership effectiveness (Granner & Sharpe, 2004). A systematic review by Granner and Sharpe (2004) synthesizes the literature identifying factors of coalition functioning, classified into four categories: 1) member characteristics and perceptions; 2) organizational or group processes; 3) organizational or group characteristics and climate; and 4) impacts and outcomes.

Aspects of each of these categories were critical to answering the research questions inherent in Evaluation Goals 10 and 11. The use of mixed methods allowed for specific constructs of partnership functioning and effectiveness to be measured quantitatively and others qualitatively, and the analysis of each type of data to contextualize the other.

EVALUATION GOALS

Two specific evaluation questions guided this portion of the evaluation (Evaluation Goals 10 & 11; STC 73.a.v):

> *Evaluation Goal 10:* Assess stakeholder-perceived strengths and weaknesses, and successes and challenges of the expanded managed care Demonstration, the UC pool, and the DSRIP pool to improve operations and outcomes.

> *Evaluation Goal 11:* Assess stakeholder-recommended changes to the expanded managed care Demonstration, the UC pool, and the DSRIP pool to improve operations and outcomes.

The overarching aim of these questions is to gain a deeper understanding of stakeholders' perceptions and experiences in the implementation of the Demonstration within each region to inform future activities.

Because organizations were required to participate in an RHP to receive UC or DSRIP funds through the Demonstration, stakeholders' perceptions may indicate the degree to which the benefits of participation in their RHP outweigh the costs for their organization, as well as what value they see in participating. This value assessment is important in each organization's sustained engagement in the activities of the Demonstration, and provides insight into stakeholders' experiences and perspectives that can inform how HHSC chooses to proceed in

implementing Demonstration activities both in this demonstration period and beyond. The partnership and coalition literature informed how the evaluation was constructed.

Four distinct research questions (RQs) emerged from the evaluation goals addressed in this section (STC 73.a.v):

> RQ1: To what extent do RHP members perceive the RHPs to be an effective structure for implementation of the Demonstration?

> RQ2: To what extent do RHP members perceive the decision-making and conflict resolution processes of their RHP to be effective?

> RQ3: What do RHP members and other key stakeholders perceive to be the strengths and weaknesses of the Demonstration, and what recommendations do they offer for changing Medicaid Managed Care (MMC), UC, or DSRIP?

> RQ4: For organizations eligible to participate that did not participate, what factors influenced their decision? What do these organizations perceive to be the opportunities and challenges of the Demonstration?

In addition to using Evaluation Goals 10 and 11 to answer these questions, the evaluation team examined the status of the evolution of the RHP learning collaboratives, which also involved multiple stakeholders, some of whom participated in DSRIP and others who did not. A review of the RHP learning collaborative activities and evaluation is included as a final section in this Appendix (Appendix D).

EVALUATION DESIGN

SAMPLE

The overall sampling frame included all organizations eligible to participate in the Demonstration UC and DSRIP projects and other defined stakeholders, which include advocacy groups, clinical providers, human and social service providers, and health plans. Individuals and families affected by services implemented through the Demonstration are also stakeholders; however, their knowledge of planning and implementation processes and the operations of the RHPs is likely insufficient to comment on that aspect of the Demonstration. Hence, individual patient experiences were assessed through the case studies conducted for Evaluation Goals 6, 7, and 8 (see Appendix E).

A roster of participating organizations was abstracted from each RHP's plan, which was publicly available on the HHSC website. The evaluation team obtained a list of types of eligible participants from HHSC and abstracted the list of participating organizations from the RHP plans to identify both the complete roster of participating organizations, as well as a roster of eligible organizations who are not participating. On behalf of the Texas A&M evaluation team, the RHP anchor institutions communicated the nature and content of the survey to each of their

member organizations and asked each organization to identify a representative who would be the most knowledgeable in answering the survey questions on behalf of the organization.

To assess non-participating organizations' perceptions of the Demonstration and what influenced their non-participation, the evaluation team included these organizations in the sampling frame. For non-participating organizations, contact information was obtained via organizational websites for their executive director/chief executive or equivalent administrator. Additional stakeholders were identified via an email listserv available through the HHSC Waiver Implementation Team; individuals interested in the Demonstration were able to subscribe to the listserv for Demonstration updates. The email listserv was selected as a source of stakeholders since it had the potential for maximizing reach to stakeholders that had expressed interest in the Demonstration for information or because it could potentially directly impact them. The primary limitation of using the listserv is the restricted amount of information about each individual (the list included email addresses only), which limits any analysis of or discussion about who did and did not ultimately participate in the survey. This sampling frame may bias the results since it may lead to underrepresentation of stakeholders not directly involved in the Demonstration.

RECRUITMENT

The Texas A&M evaluation team solicited participants by emailing a link to the online survey (see Appendix A) to organizational leaders at each RHP member organization and to other stakeholders. The following organizations received the online survey:

- All organizations participating in the Demonstration through Regional Healthcare Partnerships (RHP)
- Organizations eligible to participate but not participating in the Demonstration
- Organizations that have a stake in the outcomes of the Demonstration but were not eligible to participate through the RHPs

Screening questions and survey logic were used to direct respondents to the appropriate section based on their organizational role in the Demonstration.

UNIT OF ANALYSIS

All responses were captured at the individual level though the survey was analyzed by the type of organization the respondent represented. The recruitment strategy allowed for multiple responses per organization in recognition that especially for larger organizations, different individuals in the organization may be knowledgeable about different aspects of the RHP and the Demonstration activities. All complete responses were included in the analysis even if from the same organization; thus, if two representatives from one organization both completed the survey, and their answers were the extreme opposite ends of a scale (i.e., one said they were *extremely satisfied (5)* and the other said they were *extremely dissatisfied (1)*), those responses would be averaged to yield an overall neutral response. However, it is important to note that for the purposes of this report, all of the reported analyses were summarized at the statewide level, not focused on any single RHP or organization.

INSTRUMENT DEVELOPMENT AND MEASURES

A process evaluation conceptualization guided the approach to Goals 10 and 11. This approach can help explain differences between expected and observed outcomes, provide a context for those outcomes, and develop suggestions for future implementations of the intervention (Craig et al., 2008). Process evaluations are useful for determining the level of success of complex public health interventions, understanding why a complex intervention succeeded or failed, informing theoretical frameworks related to complex interventions, and unraveling the relationships between components of interventions (Steckler & Linnan, 2002). Process evaluations also assist in determining the impact of complex public health interventions on individuals 'receiving' the intervention (the stakeholders), and determining the stakeholders' perception of the intervention. Evaluation Goals 10 and 11 focus on the latter aspect of process evaluations, specifically, understanding the perceived impact of the expanded managed care Demonstration, the UC pool, and DSRIP in improving operations and outcomes, and stakeholder suggestions for how to improve these interventions.

Instrument development began with an environmental scan of relevant literature for the formation of the quantitative and qualitative sections of the survey. A pool of relevant, existing survey items was collected and reviewed internally and with the HHSC evaluation team. Where possible, existing measures were used in the survey; however, in some cases, new measures were developed to appropriately assess the evaluation questions.

The survey instrument was divided into three modules designed to capture information from distinct types of respondents. Screening questions were used to direct respondents to the appropriate starting module and through the remaining survey modules as appropriate. Table 2 summarizes the measures included in the survey. The full survey instrument is available at the end of Appendix C.

Table 2. Summary of Measures

Module Research Questions	Target Respondents	Categories of Measures
Module 1 **Research Questions Addressed:** RQ1: To what extent do RHP members perceive the RHPs to be an effective structure for implementation of the Demonstration? RQ2: To what extent do RHP members perceive the decision-making and conflict resolution processes of their RHP to be effective?	RHP Members—those contributing intergovernmental transfer (IGT) funding or receiving funds through the Demonstration	Role Clarity: participant knowledge about partnership purpose, structure, and operations Leadership: knowledge, contributions, guidance, group management skills of the lead agency Formalization: formalized rules and procedures, bylaws, meeting organization, decision-making procedures Satisfaction with Group: feeling heard and valued, comfort, satisfaction Communication: quality of member-staff and member-member communication, productivity, frequency Collaboration: degree to which partnership has increased cooperation, networking, and information exchange Conflict: measure of tension in partnership caused by opinion differences, personality, hidden agendas, power struggles Decision Making: extent of influence in determining certain types of partnership action
Module 2 **Research Questions Addressed:** RQ3: What do RHP members and other key stakeholders perceive to be the strengths and weaknesses of the Demonstration, and what recommendations do they offer for changing Medicaid Managed Care (MMC), UC, or DSRIP?	RHP Members and Other Stakeholders	Strengths of Medicaid Managed Care, UC, and DSRIP Weaknesses of Medicaid Managed Care, UC, and DSRIP Recommendations for Medicaid Managed Care, UC, and DSRIP
Module 3 **Research Questions Addressed:** RQ4: For organizations eligible to participate that did not participate, what factors influenced their decision? What do these organizations perceive to be the opportunities and challenges of the Demonstration?	Other Stakeholders, Eligible but Non-Participating Organizations, UC-only Hospital RHP Members	Reasons for not participating Greatest Opportunities of the Demonstration Greatest Challenges of the Demonstration Interest in Future Participation

DATA COLLECTION

The surveys were self-administered and web-based using the online survey service Qualtrics®. The survey was open for approximately six weeks from late April 2014 through May 2014, and invitations to participate were distributed in two waves. The first wave went to all RHP Stakeholders and Other Stakeholders identified through RHP plans (n=783). The second wave of the survey went to Other Stakeholders identified via the HHSC Waiver Implementation Team's master distribution list after removing duplicates and those already included in the first wave as well as advocacy groups and associations identified by the evaluation team (n=5,896). Two email reminders were sent at two-week intervals. Most of the respondents responded in the first week, with a large number also responding following the first reminder email. Response tapered off by the fifth week, and with few additional responses following the second reminder email and given the evaluation timeline, the decision was made to close the survey at the end of May. Respondents were provided with an overview of the survey purpose, relevant definitions of terminology used throughout the survey, and a listing of common acronyms referenced in the

survey questions. Respondents participating in more than one RHP received Module 1 for each RHP in which they were a member.

ANALYTIC APPROACH

The survey was distributed to 6,679 individuals. Two hundred fifty-four (254) or 3.8% of the emails were undeliverable, due to inactive email accounts or incorrect email addresses. A total of 708 survey responses were recorded, with 366 completed surveys and 342 partial surveys. Individuals that opened the survey but provided no responses were not counted in the overall response rate. A total of 533 respondents provided feedback in at least one module and these responses were included for analysis. The remaining 175 respondents provided answers only to the screening questions and not within specific modules; therefore, they are excluded from analysis. This resulted in a response rate of 8% for responses included in analysis, which is within the expected range.[12] Among RHP members, the response rate was approximately 55%. Because not every respondent was eligible for every module, the total number of responses within each module varies.

The survey responses were analyzed using both quantitative and qualitative methods. All quantitative analyses were performed using Stata IC/13.1. Scaled items were analyzed to determine either the frequency or mean value of responses, depending on the appropriate summary statistic for the item. Item frequencies and means are reported, with item scales defined as results are presented.

Qualitative analysis was used for survey questions with open-ended responses. A mixed-methods approach in answering these evaluation questions provides qualitative information to contextualize and interpret the quantitative data. Open-ended questions included in the stakeholder survey received lengthy and detailed responses, providing the evaluation team a sufficient amount of feedback to analyze qualitatively. The evaluation team used an iterative thematic analysis approach to code the data for each question. Using this process, two team members (Coders A & B) jointly conducted the initial coding schemes (first-order codes), and then re-grouped into more macro-level codes (second-order codes). A third team member (Coder C) reviewed the coding schemes to validate the interpretation and worked with one of the original team members (Coder A) on the final re-grouping (third-order codes), which was then validated by the other original coder (Coder B). The third-order codes were used as the

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[12] According to one meta-analysis of response rates from web and mail surveys, response rates in web-based surveys range from 7% to 88% and vary by type of respondent with web-based surveys having lower response rates than mailed surveys in populations of professionals, employees, and the general population compared to the college population (Shih & Fan, 2008). The response rates for this survey fall into this range.

macro-level themes, with the second-order codes subordinated within them serving as sub-themes.

RESULTS

OVERALL RESPONDENT PROFILE

The largest proportions of individual respondents were from private hospitals (17%), hospital districts/authorities (16%), and community mental health centers (13%). Seventeen percent (17%) of respondents listed "Other" as their organization type and these included non-profit organizations, federally qualified health centers, governmental agencies, and universities. A complete breakdown of respondents' organizational affiliations is included in Table 3.

Table 3. Overall Respondent Organizational Affiliations

Organization Type	Frequency	Percent
Private hospital	88	17%
Hospital district / hospital authority	85	16%
Community mental health center	67	13%
Advocacy group / statewide association	45	8%
Academic health science center	34	6%
County government	28	5%
Physician group	22	4%
Health department	19	4%
Health plan	18	3%
Public hospital	13	2%
School district	8	2%
City government	7	1%
Health district	7	1%
Other	92	17%
Total	533	100%

All RHPs were represented in the survey. Almost three-quarters (72%) of the respondents participated in one or more RHPs, and 26% of respondents did not participate in any RHP. The remaining 2% of respondents did not identify whether or not they were members of an RHP. Respondents that participated in more than one RHP were from:

- Community mental health centers
- Private not-for-profit hospitals
- Academic health science centers
- Public hospitals
- Private for-profit hospitals
- Physician groups
- Hospital districts/authorities
- Other types of organizations

MODULE 1: MEMBERS' EXPERIENCE WITH THEIR RHP

Respondent Profile

Because not every respondent was eligible for every module, the total number of responses within each module varies. Also, individual respondents representing an organization participating in more than one RHP would have responded to Module 1 for each RHP in which their organization was participating (e.g., a community mental health center whose service region covered counties in four different RHPs would have completed Module 1 four times—which would show as four responses).

A total of 431 survey responses were provided by organizations formally participating in at least one RHP. The majority (70%) were participating in multiple roles within their RHP as a DSRIP provider, UC provider, IGT entity, and/or the anchor institution. The remaining participated in only one role within their RHP. Community mental health centers, hospital districts and authorities, private not-for-profit and for-profit hospitals, and health departments comprised the majority of respondents. Table 4 provides a summary of all respondent organizational affiliations for Module 1.

Table 4. Respondent Organizational Affiliations, Module 1

Organization Type	Number of Respondents	Percent
Community mental health center	98	22%
Hospital district / hospital authority	76	17%
Private, not-for-profit hospital	67	15%
Academic health science center	44	10%
Private, for-profit hospital	31	7%
Health department	23	5%
County government	17	4%
Public hospital	16	4%
Physician group	11	3%
City government	6	1%
Health district	5	1%
Other	37	8%
Total	431	100%

Anchor Institution Effectiveness

Respondents indicated the anchor institutions provided leadership and guidance in the development of the RHP plans, as well as provided feedback on organizational project plans. The level of guidance from anchor institutions varied from direct technical support on project development to serving more broadly as an intermediary between HHSC and the performing providers. The anchor institution roles in implementation of the approved RHP plans involved providing coordination, clarifying rules with HHSC, assisting with reporting, communicating with members regarding deadlines, and providing technical assistance.

Overall, RHP member respondents indicated that their anchor institution performed expected leadership functions, including providing leadership and guidance on RHP operations and

providing accurate and timely information. Although the results show a high level of overall functionality, results vary by RHP. The range of means by RHP for each question is provided in the respective tables below. Respondents were highly satisfied with anchor institution effectiveness in providing information and managing meetings, again with some variation across RHPs. Table 5 and Table 6 below summarize the results of survey questions related to anchor institution leadership, guidance, and effectiveness.

Table 5. Member's Experience: Anchor Institution Leadership and Guidance, Statewide

	Yes	Yes, but limited	No	I don't know	N
Provided **leadership** in initiation of the RHP	74% (43%-100%)	7% (0%-27%)	2% (0%-17%)	17% (0%-43%)	324
Provided **guidance** in initiation of the RHP	76% (50%-100%)	7% (0%-33%)	1% (0%-10%)	15% (0%-38%)	323
Provides **leadership** in ongoing RHP operations	78% (47%-100%)	10% (0%-33%)	2% (0%-10%)	11% (0%-25%)	323
Provides **guidance** in ongoing RHP operations	79% (47%-100%)	9% (0%-33%)	2% (0%-10%)	11% (0%-25%)	322
Provides **accurate knowledge** about Demonstration Activities	82% (58%-100%)	7% (0%-20%)	1% (0%-10%)	11% (0%-25%)	323
Provides **timely knowledge** about Demonstration Activities	83% (58%-100%)	7% (0%-33%)	1% (0%-10%)	10% (0%-25%)	322
Provides **accurate technical assistance**	74% (47%-100%)	10% (0%-33%)	4% (0%-20%)	12% (0%-26%)	323
Provides **timely technical assistance**	75% (40%-100%)	9% (0%-27%)	4% (0%-20%)	12% (0%-26%)	322

The scale for responses included *Yes (1)*, *Yes but limited (2)*, *No (3)*, and *I don't know (4)*. Percentages are presented to summarize the number of respondents selecting *each option*. A range is provided to demonstrate differences across RHPs. The range of values in the tables above represents percentages or means across RHPs. These values are sensitive to the sample size for individual RHPs and, in the case where *I don't know (4)* was a response option, a low value might indicate that a larger proportion of the respondents were unsure based on their experience or exposure to the anchor institution's activities.

Table 6. Member's Experience: Anchor Institution Effectiveness

Rate your anchor institution's:	Statewide Mean	RHP Minimum	RHP Maximum	N
Effectiveness in providing **accurate information**	3.8	3.4	4.0	313
Effectiveness in providing **timely information**	3.8	3.4	4.0	312
Effectiveness in **managing meetings**	3.7	3.2	4.0	312

Scale for responses included *Very Effective* (4), *Somewhat Effective* (3), *Mostly Ineffective* (2), and *Completely Ineffective* (1). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates greater effectiveness. Minimum and maximum values provided are the range of mean values across RHPs.

As evident in the data, respondents were largely positive about their anchor's performance. There were, however, organizations within certain RHPs that had negative perceptions of aspects of the RHP they were a part of. It is important to note that while the negative responses were consistent across three RHPs, the number of respondents within those RHPs was low making the frequencies sensitive to outlier comments. For example, in one RHP, there were five

RHP members who responded to the survey, which equates each respondent's answer to 20% of the total. Thus, drawing generalizations and conclusions regarding negative experiences is not possible given these low cell counts.

Role & Influence of RHP Members

The average number of organizational members in an RHP at the time of the survey was 24, with a range from 10 to 49 in any single RHP. Member involvement is a key component of the RHP structure. Survey respondents indicated that the RHP members were involved in a number of roles as the goals and objectives of their RHP plan were designed. Although an individual organization could have played multiple roles in the RHP planning process, the question was designed to capture each organization's **primary perceived role**; thus, the answers were constructed such that they could only choose one answer. Members reported they helped *develop* (32%), *approve* (15%), *recommend* (15%) and *advise* (12%) on the RHP plan's goals and objectives. About one-quarter of respondents either had *no role* (4%) in designing the goals and objectives or were *not aware* (21%) of their role during that phase.

Across RHPs, members were also involved in determining the governance structure of their RHP. Nineteen percent were involved in approving the governance structure, while others participated in developing (14%), recommending (12%), or advising (11%) on the governance structure. Just over 30% of respondents were unsure of their role, and 12% had no role in determining the governance structure. These responses could also be impacted based on the type and formality of governance structure their RHP developed.

Across the stakeholder groups in each RHP, perception of the level of influence each group had in making RHP decisions varied. Overall, respondents perceived that HHSC and CMS had the most influence in decision making, while staff from the anchor institutions and RHP member organizations had somewhat less influence. Other local stakeholders were noted as having some, but potentially not much, influence. See Table 7 for complete results on stakeholder influence.

Table 7. Member's Experience: Stakeholder Influence within RHPs

	Statewide Mean	RHP Minimum	RHP Maximum	N
HHSC Waiver team	3.7	3.1	4.0	277
CMS	3.7	3.0	4.0	275
Anchor Institution staff	3.4	3.0	3.8	274
Staff from the RHP member organizations	3.1	2.6	3.4	273
Other local stakeholders in region	2.7	2.1	3.8	261

Scale for responses included *A lot of influence* (4), *Some influence* (3), *Not much influence* (2), *No influence* (1), and *I don't know* (5). The mean value is the mean score across all RHPs, derived from the scale values as indicated, and their calculation does not include *I don't know* responses. In this case, a higher mean score indicates greater influence.

RHP Operations

Not all RHPs use the same approach to managing operations and the survey included questions related to how RHPs managed their collaborations. Only 42% of survey respondents indicated their RHP had documented procedures for decision making, although 50% did not know if these existed. Again, this could be influenced by the formality of an RHP's governance structure. A majority of respondents (66%) said that their RHP had set ground rules for working together, again with a large proportion (34%) not sure if there were ground rules at all. Most respondents indicated their RHP had written agendas at meetings (88%), a mechanism for monitoring RHP activities (75%), and a mechanism for members to provide feedback (82%). There is considerable variation across RHPs. For example, in several RHPs, only 50% of respondents said their RHP had a mechanism for providing member feedback, while other RHPs had 100% stating such a mechanism existed.

Communication

With such a diverse number and size of organizations participating in RHPs, communication methods, frequency, and productivity are essential. Across RHPs, mailed, emailed, and faxed written materials appear to be the most frequently used methods of communication, with group discussions at RHP meetings, webinars, verbal reports at RHP meetings, RHP websites, informal communication outside of RHP meetings also rating highly in terms of importance. See Table 8.

Table 8. Reported Importance of Communication Methods

	Statewide Mean	RHP Minimum	RHP Maximum	N
Mailed, emailed, and faxed written materials	3.8	3.6	4	314
Verbal reports at RHP meetings	3.5	3.1	3.8	312
Group discussions at RHP meetings	3.6	3.3	3.9	313
Informal communication outside of RHP meetings	3.4	2.9	3.9	311
Distribution of materials/information via the RHP website	3.5	2.5	3.9	310
Distribution of materials/information via social media	2.3	1.8	2.9	311
Reports and/or communication via webinars	3.5	3	4	311

*Scale for responses regarding communication methods: *Very important* (4), *Somewhat important* (3), *Not very important* (2), and *Not at all important* (1). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates greater importance of communication method.

Distribution of materials and information via social media seems to be much less important as a tool for communication. The low use of social media may be related to the complexity of information shared among RHP members during the first two years of the Demonstration. Most of the organizations involved would typically rely on email and meetings to discuss complex ideas and to transmit planning and reporting documents (which would not as easily be conducted by social media). Despite apparent low use of social media in the RHPs, this may be an avenue for expanding communication within RHPs and a means of communicating with the larger population about RHP activities.

Respondents indicated that communication between anchor institution staff and the RHP members was *somewhat frequent* to *very frequent* in all RHPs, and is rated as productive by 98% of survey respondents. However, there is less frequent communication among RHP members, and when communication does occur among RHP members, it may be slightly less productive than communication between the anchor institution and RHP members. This may be due to the nature of the RHPs, which are centralized around the anchor institution who is responsible for communication with RHP members and provides technical assistance as needed. Communication among RHP members is likely centered around RHP-wide telephone calls or webinars and in person meetings, which may not be as frequent as one-on-one communication between an anchor institution and a RHP member. See Table 9.

Table 9. Member's Experience: Frequency and Productivity of Communication in RHPs

	Statewide Mean	RHP Minimum	RHP Maximum	N
Communication between anchor institution staff and RHP members				
Frequency*	3.6	3.0	3.9	311
Productivity**	3.7	3.1	3.9	311
Communication among RHP members				
Frequency*	2.9	2.4	3.3	311
Productivity**	3.2	2.8	3.8	310

*Scale for responses regarding frequency of communication included *Very frequent* (4), *Somewhat frequent* (3), *Mostly infrequent* (2), and *Completely infrequent* (1). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates greater frequency of communication.
**Scale for responses regarding productivity of communication included *Very productive* (4), *Somewhat productive* (3), *Mostly unproductive* (2), and *Completely unproductive* (1). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates greater productivity of communication.

Tension

A section of the survey examined the existence of tension within the RHP, and the sources of that tension. Overall, respondents reported very little to no tension among RHP members or between the anchor institution and RHP members. Where tension was reported, RHP members largely attributed tension to differences in opinion, hidden agendas, the unequal distribution of resources, and historical relationships. Again, the level and source of tension varies by RHP, with some reporting higher levels of tension across all sources. For example, when asked about tension among RHP members related to unequal distribution of resources, the range of means was 1.1 to 2.7 with higher mean values reflecting more tension. Although there is variation by RHP and within each possible source of tension, the overall reported tension was low statewide with the means falling between very little tension and no tension for all sources. Table 10 summarizes these results.

Table 10. Member's Experience: Sources of Tension in the RHPs

	Statewide Mean	RHP Minimum	RHP Maximum	N
Tension among RHP members				
Differences of opinion	1.6	1.2	2.0	307
Personality clashes	1.4	1.1	1.7	306
Hidden agendas	1.6	1.1	2.1	306
Power struggles	1.6	1.1	1.9	304
Imbalance of power	1.6	1.1	2.3	303
Unequal distribution of resources	1.7	1.1	2.7	307
Historical relationships	1.7	1.0	2.3	306
Inability to reach consensus	1.5	1.1	2.0	306
Tension between the anchor institution and RHP members				
Differences of opinion	1.5	1.1	2.2	303
Personality clashes	1.3	1.0	2.0	304
Hidden agendas	1.5	1.0	2.3	303
Power struggles	1.4	1.0	2.4	303
Imbalance of power	1.5	1.0	2.6	304
Unequal distribution of resources	1.5	1.0	2.6	304
Historical relationships	1.5	1.0	2.3	304
Inability to reach consensus	1.3	1.0	2.1	303

Scale for responses included *No tension* (1), *Very little tension* (2), *Some tension* (3), and *A lot of tension* (4). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates more tension.

Member Satisfaction and Perceptions of Outcomes

In general, RHP member respondents were satisfied with their RHP. The survey assessed satisfaction in three areas:

- Satisfaction with the RHP's progress toward addressing community needs
- Satisfaction with the RHP's commitment to all partners having an opportunity to participate
- Satisfaction with the RHP leadership's level of commitment to listening to the ideas and opinions of people and organizations involved in the RHP

In each area respondents indicated high levels of satisfaction, although there was variation across RHPs (see Table 11). The mean level of satisfaction related to addressing community needs was 3.57, with one (1) being the lowest satisfaction and four (4) being the highest satisfaction, and the range across RHPs was 2.78 to 3.83.

To assess respondent perceptions of outcomes, the survey asked two questions regarding the overall impact of the RHP and collaborations within the RHP (see Table 11). Statewide, respondents agreed that their RHP was increasing collaboration among organizations in the region to increase access to health services (mean: 3.6; range: 3.0-4.0). Similarly, respondents

felt as though the Demonstration activities were beneficial for the residents of their community (mean: 2.85; range: 2.5-3.0).

In the analysis performed at this point, there is no clear pattern as to which RHPs have members that experience greater satisfaction. For example, those RHPs with the lowest satisfaction represent both urban and rural geographies and have different governance structures.

Table 11. RHP Member Satisfaction and Perceptions of Outcomes

	Statewide Mean	RHP Minimum	RHP Maximum	N
Satisfaction with the RHP's progress towards addressing community needs*	3.6	2.8	3.8	316
Satisfaction with the RHP's level of commitment to all partners having an opportunity to participate*	3.7	2.6	4.0	316
Satisfaction with the RHP leadership's level of commitment to listen to the ideas and opinions of people/organizations involved in the RHP*	3.7	2.9	4.0	313
The RHP is increasing collaboration among organizations in the region to increase access to health services**	3.6	3.0	4.0	313
The Demonstration activities are beneficial for the residents of your community***	2.9	2.5	3.0	311

*Scale for responses regarding frequency of communication included *Very satisfied* (4), *Somewhat satisfied* (3), *Somewhat dissatisfied* (2), and *Completely dissatisfied* (1). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates greater satisfaction.
**Scale for responses included *Agree* (4), *Somewhat agree* (3), *Somewhat disagree* (2), and *Disagree* (1). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates greater perceived collaboration.
***Scale for responses included *Beneficial* (3), *Somewhat beneficial* (2), and *Not beneficial* (1). The mean value is the mean score across all RHPs, derived from the scale values as indicated. In this case, a higher mean score indicates greater perceived benefit.

MODULE 2: STAKEHOLDERS' PERCEPTIONS OF THE DEMONSTRATION

Respondent Profile

A total of 291 respondents provided comments in the second module of the survey, which asked questions about stakeholder perceptions of the Demonstration. Table 12 summarizes the respondents by organization type. The largest percentage of respondents were affiliated with hospital districts or authorities (23%), private hospitals (21%), and community mental health centers (15%). Eleven (11) percent of respondents identified with the category of Other and included representatives from not-for-profit organizations, universities, state government agencies not affiliated with implementation of the Demonstration, hospice and home care organizations, and federally qualified health centers, as well as private citizens.

Table 12. Respondent Organizational Profile, Module 2

Organization Type	Frequency	Percent
Hospital district / hospital authority	67	23%
Private hospital	61	21%
Community mental health center	45	15%
Academic health science center	16	5%
Advocacy group / statewide organization	16	5%
County government	12	4%
Physician group	9	3%
Health department	9	3%
Public hospital	8	3%
City government	6	2%
Health plan	6	2%
Health district	4	1%
Other	32	11%
Total	291	100%

The majority of respondents participated in only one RHP, but some participated in as many as four RHPs. Over 85% of respondents identified as providers of Medicaid Services. Respondents reported they were affected or impacted by many components of the Demonstration, including Medicaid Managed Care (MMC), UC (UC), and DSRIP through either direct involvement in Demonstration implementation or as impacted stakeholders. Almost all respondents were affected by DSRIP (84%) and UC (70%) while smaller percentages were affected by the changes to MMC (55%).

Perceptions of Medicaid Managed Care Expansion

While the Demonstration expanded MMC to additional regions in the state, many high population areas of the state were not affected by the expansion because managed care had existed for many years. However, the dental and pharmacy changes were new statewide. In the regions where the expansion changed coverage from fee-for-service to managed care, the effect on providers is pronounced.

Using the survey, stakeholders were asked whether their organization was affected by MMC expansion or changes. Those who answered affirmatively were subsequently asked about overall changes in certain areas related to their organization's experience with MMC. The areas of interest were: timeliness of claim payments, pharmacy benefits manager, provider network, access to prescription drugs, patient adherence to prescription drugs, value added benefits for clients, administrative burden, claims processing, patient access to services provided, quality of services provided, cost of services provided, and coordination of care among service providers. In general, respondents indicated most things had stayed the same or only slightly improved with the expansion. However, three particular items were noted as areas where there had been a potential decline in Demonstration quality and/or implementation (item scale included *Improved* [1], *Stayed the Same* [2], *Declined* [3]): timeliness of claim payments (mean: 2.3), administrative burden (mean: 2.5), and claims processing (mean: 2.3).

In addition to noting changes in the program, stakeholders were asked to comment on their perceived strengths and weaknesses of MMC. Program stakeholders' (n=188) responses were

diverse. Overall, their feedback focused on five areas: MCO operations; changes in processes; effects on access; organizational impacts; and the need for systemic change.

MCO Operations

Stakeholders across the state whose organizations were impacted by MMC indicated that MCO operations presented a substantial challenge for efficiency of business operations (see Table 13. Specifically, respondents expressed that the credentialing processes in some cases were not efficient and took too long. One respondent from a private, for-profit hospital stated,

> ...enrollment of providers is very slow.

And a community mental health center respondent emphasized,

> ...credentialing is repetitive and redundant.

The length of time taken to process contracts between the MCOs and the providers was also noted to be excessive and prohibitive. One of the contributing issues identified by respondents was MCO staffing—both that they seemed to be understaffed for the amount of administrative work occurring to do managed care expansion, as well as the turnover among staff that affected continuity of contacts and institutional knowledge. Finally, respondents expressed that these issues culminated in often lengthy waits for processing of claims and receipt of payment. Many of the recommendations made by survey participants focused on clarifying the credentialing process and streamlining processing of claims and payment, as well as having the MCOs more adequately staffed.

Table 13. Emergent Themes from Qualitative Analysis, Perceptions of Medicaid Managed Care Expansion and MCO Operations

Theme	Recommendations
• Inefficient MCO credentialing process • MCO administration • Claims processing and payment	• Clarify the credentialing process • Adequately staff MCOs • Streamline processing of claims and payment to reduce wait time and time to payment

Processes

While the first theme focused on the operations of the MCOs as individual organizations, a second, related theme emerged that the overall processes of MCOs involved in MMC presented challenges to providers (see Table 14). Survey respondents indicated prior authorizations are problematic in the extent to which they are required for services that did not previously require them and the length of time to obtain them. A respondent from a private not-for-profit hospital commented,

> Approval for urgent conditions should not take three or more days—we should be able to get approval immediately.

Pharmacy denials were also reported as problematic, making it difficult for providers to serve their patients effectively. Several respondents discussed that the differences among MCOs had

a significant impact on providers working with multiple MCOs, as they had to be knowledgeable about the requirements and processes of each, even though they were all administering MMC. A community mental health center respondent suggested

> "…streamlin[ing] provider regulations, enrollment procedures and claims processing rules."

This appears to cause substantial frustration among providers, as well as the limited data sharing between the MCOs and providers. Respondents offered recommendations for standardizing policies and processes to alleviate some of the administrative burden on providers related to MCO differences and prior authorizations for certain services.

Table 14. Emergent Themes from Qualitative Analysis, Perceptions of Medicaid Managed Care Expansion and Processes

Theme	Recommendations
• Changing requirements and long waits for prior authorizations • Inconsistency in requirements across MCOs	• Streamline requirements for prior authorizations and decrease time to approval • Standardize policies and processes

Access

One of the key goals of the Demonstration is to improve access to care for low-income residents across the state. While changes in access to care emerged as a theme, response was mixed as to whether the expansion of MMC improved access or hindered it. Respondents indicated that MMC expansion provided patients more choice in where to get care. In addition to the effect on access to services, participants also provided substantive feedback in terms of the impact on access to prescriptions. For example, pharmacy benefits in MMC removed the previous limit of three covered prescriptions per month, which was beneficial for the growing number of patients with multiple chronic diseases. In contrast, some respondents indicated that access declined because of the limited type of providers covered; the exclusion of public health providers, chiropractors, and hospice; and the fact that some providers, especially in rural areas, choose not to accept Medicaid patients. Several respondents also specified that the credentialing process limited providers available. For example, a respondent from a statewide membership organization explained,

> Providers who were willing to see a few Medicaid clients do not continue under managed care. Managed care adds significant burden and cost to providers.

Stakeholders recommended expanding eligible providers and streamlining the credentialing process to encourage more providers to participate (see Table 15).

Table 15. Emergent Themes from Qualitative Analysis, Perceptions of Medicaid Managed Care Expansion and Access

Theme	Recommendations
• Access to prescription drugs • Access to providers (specialists) • Access to providers (Urban versus Rural)	• Expand eligibility for providers • Streamline the credentialing process for providers

Organization Impact

An additional theme emerging from stakeholder feedback was the impact of the changes to MMC on their organizations (see Table 16). This burden appeared to derive from a variety of sources within the system that affected patients' ability to change plans, number of plans available, providers credentialed to offer services, and processes providers were to follow to receive payment. A respondent from a private, not-for-profit hospital commented,

> The fact that people can change plans every 30 days is creating a mess. We don't know who to bill for services and it takes many hours to figure it out. By then, we are being denied payment due to untimely billing.

Other respondents affected by MMC expansion discussed the burden of time related to verification of benefits, claims adjudication, and the volume of documentation. Specifically, the increased administrative burden increased their cost and time investment to participate and to see Medicaid clients. A community mental health center respondent expressed,

> Transitioning to a system with more payers creates an additional admin[istrative] burden on providers without a commensurate improvement in service quality.

Table 16. Emergent Themes from Qualitative Analysis, Perceptions of Medicaid Managed Care Expansion and Organization Impact

Theme	Recommendations
• Administrative burden • Inefficiency in processes	• Reduce administrative burden by streamlining / standardizing processes

Recommendations for Systemic Changes

Among the recommendations provided by stakeholders, a theme emerged that called for overarching systemic change (see Table 17). Several respondents called for a move to a single-payer system, or management by a single entity. Others focused on streamlining of processes across MCOs to align reporting strategies or critical outcomes measures. Several stakeholders called for creating formal systems and a culture of communication between and among HHSC, MMC organizations, and providers. A state agency respondent recommended,

> Team work. Let the right hand know what the left hand is doing. Provide adequate information for ALL those involved.

Finally, regarding mental/behavioral health services specifically, respondents recommended better education for managed care companies on previously uncovered services to enhance their understanding of what community mental health centers do and the services they provide.

Table 17. Emergent Themes from Qualitative Analysis, Perceptions of Medicaid Managed Care Expansion and Recommendations for Systemic Changes

Recommendations
• Streamline processes across MCOs
• Create formal systems and increase communication across all stakeholders
• Enhance MCO understanding of CMHCs role as a provider

Perceptions of Uncompensated Care (UC) Program

Stakeholders whose organizations were affected by the UC program were asked about their perceptions of the strengths and weaknesses of UC compared to the previous Upper Payment Limit (UPL) program, as well as their recommendations for improvement. A key change in UC compared to UPL is that the algorithm to calculate payment caps is based on costs rather than charges.

Strengths of Uncompensated Care Program

Stakeholders commonly identified three key strengths of the UC program relative to the former UPL program:

- Increase in available resources
- Incentive to improve outcomes
- Increase in collaboration and participation in the program

First, the increase in funds available was emphasized as an important aspect of the program. Respondents indicated that these resources helped compensate for Medicaid cuts, especially given the expansion of eligible costs, such as outpatient services. In addition, participants emphasized that the increase in funds available increased services to expanded populations at the community level, and also allowed for a greater variety of services and inclusion of non-inpatient services. As stated by a respondent from a hospital district/authority,

> Unlike UPL which was driven by cap room, UC more appropriately reflects the cost of uncompensated care. UC compensates health systems for outpatient care which reduces downstream expensive hospital care.

A second theme that emerged was the incentive to improve outcomes. Respondents expressed that the UC program improved accountability, as well as transparency in outcomes. These themes were pronounced among local governments contributing IGT. Two respondents from county government commented on their respective perspective regarding UC, saying,

> [There is an] incentive to improve health outcomes…

> …additional reporting is a benefit of the UC program that was not completely addressed under UPL.

Finally, stakeholders highlighted the increase in collaboration and participation in the program, particularly noting the value of new public/private partnerships catalyzed by the UC program. A respondent from a private, not-for-profit hospital commented,

> The UC program allows private & public entities to work together effectively
> & efficiently to provide needed services.

Weaknesses of and Recommendations to Improve Uncompensated Care

Although several strengths were noted in UC relative to UPL, stakeholders also identified a variety of weaknesses and offered specific recommendations to address them (see Table 18). A recurrent theme among participants' responses was that UC was more complicated than UPL, resulting from lack of transparency in the process and resulting in additional administrative burden. A respondent from a private, for-profit hospital compared the two:

> The UPL program did not come complete with burdensome paperwork,
> spreadsheets, uncertain payment dates and amounts that the UC program
> has.

Respondents expressed concern that the UC goals were undefined and directions were vague. In addition, several comments complained about too many last minute changes in the process. Increased administrative burden was reported based on more complicated worksheets and "too much red tape;" this was particularly problematic because of the demand placed on smaller hospitals with less staff capacity to accommodate the increased paperwork. A hospital district/authority representative mentioned,

> It requires a lot of information to be turned in and in smaller hospitals we
> are constantly swamped with demands from all sources.

Recommendations to Improve Uncompensated Care

Stakeholders' recommendations were to combine the Disproportionate Share application tool and the UC tool, and to standardize and streamline the rules and regulations.

A second theme focused on the timeliness of UC payments. Hospital stakeholders expressed frustration that the timing of UC payments was unpredictable. Although they were originally told that payments would be quarterly, in actuality, the payments did not occur quarterly and were irregular. In addition, delays in payment create challenges for hospitals—particularly smaller hospitals—who are dependent on UC payments for cash flow. The subsequent recommendations from participants were simple: set the funding cycle to quarterly; create and follow a timeline; and make payments on time. A private, not-for-profit hospital respondent was emphatic:

> HHSC should prepare a calendar for timely UC payments, and stick to it.

While stakeholders perceived a strength of UC to be that there were more funds allocated to the state than under UPL, one of the weaknesses identified was that less money was actually coming to hospitals. One reason for this is that DSRIP provided IGT entities an alternative way to commit their funds to improving health care in their community with accountability for achieving specific outcomes. Some city and county governments that had put up IGT for hospitals to participate in UPL previously could now use their IGT to support a specific DSRIP

project, which was more concrete for decision-makers and constituents to understand. Participants noted that there was less money for charity care, and that the reimbursement rates were lower. One respondent from an academic health science center commented,

> UPL was better reimbursement for health care services.

Respondents also indicated concern that the design of the Demonstration was that funding for UC would decrease over time in favor of increasing DSRIP funding. As stated by a respondent from a private, not-for-profit hospital,

> Constraining the UC program in favor of the DSRIP program is unfair to private providers who serve large Medicaid and uninsured populations.

A final theme related to weaknesses in the UC program was the exclusion of certain providers and services. Specifically, stakeholders noted that although the overall Demonstration had an expanded focus in areas such as mental/behavioral health, providers of certain mental health services, hospice, and other community-based services were excluded from the UC program. One respondent whose organization fell under the "Other" category pointed out,

> Until those providers that are receiving 1115 funds under this program [UC] have an obligation to provide contracted funding to downstream providers who are serving the unfunded population meeting specific needs, such as hospice care, the program is actually having a detrimental effect on funding for agencies willing to provide this care.

Table 18. Emergent Themes from Qualitative Analysis, Perceptions of Uncompensated Care and Recommendations for Systemic Changes

Identified Weaknesses	Recommendations
• UC more complicated than UPL • Timeliness of payments • Less money flowing into hospitals, decreasing UC funds available • Exclusion of certain providers	• Simplify the program • Improve timeliness of payments by implementing a quarterly payment schedule and making payments on time

Perceptions of Delivery System Reform Incentive Payment (DSRIP) Program

Related to DSRIP, participating organizations were asked to indicate strengths and weaknesses among a predetermined list of program attributes. In addition to the quantitative survey questions on strengths and weaknesses, the survey included open-ended questions that allowed respondents to provide more in-depth qualitative feedback on strengths, weaknesses, and recommendations for program improvement.

Strengths of DSRIP

The top five strengths of DSRIP identified by respondents using a predetermined list of potential strengths and weaknesses were:

- Resources to serve more patients/clients
- Opportunity to design innovative projects
- Improved patient outcomes
- Access to health services programs
- Quality of health service programs

In response to the open-ended questions, stakeholder perceptions of the strengths of the DSRIP program highlighted the statewide scope and the investment in health services to allow for innovation. A community mental health center respondent expressed,

> This is a great opportunity to really change the health care delivery system.

Specifically, they noted that the resources and structure of DSRIP helped facilitate certain collaborations that would not have otherwise occurred. One respondent from a hospital district/authority noted,

> Collaboration among providers can no[t] be overstated. Very important. The Learning Collaborative structure allows for even more collaboration and the opportunity to focus on regional efforts, as opposed to just project or provider level efforts.

Participants emphasized that these resources for new and expanded services improved access to care for residents and quality of care. A hospital district/authority respondent indicated that DSRIP would enable them to

> ...improve access to care, [and] services to those who have no resources.

This question about DSRIP successes may have been somewhat premature in the timeline of DSRIP implementation, as many stakeholders indicated that it was "too early to tell" how effective or successful the program would be.

Weaknesses of DSRIP

While the DSRIP program generated a great deal of excitement about the opportunity to have resources to innovate, those engaged in DSRIP clearly identified areas needing improvement (see Table 19). Three key themes emerged from their responses regarding both weaknesses and recommendations to improve DSRIP:

- Need for improvement of DSRIP implementation
- Desire for definition and clarification of outcome expectations
- Necessity for HHSC and CMS to be sensitive to contextual differences among organizations, communities, and regions

Participants provided substantial feedback on the need to improve the DSRIP implementation process. Sub-themes within that category focused on clarification and simplification of processes and protocols. Stakeholders also indicated that, in many cases, the timelines provided were unrealistic for providers, for HHSC giving feedback and guidance, and for release of funding to providers. A final sub-theme focused on improved communication and

collaboration between participants and HHSC/CMS—inclusiveness of innovative project ideas and technical assistance to enable more effective participation. Several participants expressed dissatisfaction that project ideas they developed in response to identified community need prior to the DSRIP menu's release were categorically dismissed when they did not fit into the parameters of the menu.

Recommendations to Improve DSRIP

Specifically, respondents recommended minimizing changes and defining expectations early to allow those involved time to develop their plans thoroughly without having to change strategies multiple times.

> [We] recommend having a clearly defined formula prior to DSRIP planning of projects and for the State to not make changes after DSRIP projects were planned and designed.

A second theme focused on the need to define and clarify outcome expectations. Respondents noted that HHSC should improve Category 3 outcome measures by accommodating differences in providers and projects through the metrics available in each one. To do this, it was suggested that HHSC align metrics across categories to simplify outcome measures, as well as reduce changes to outcome measures after projects had already begun implementation. As stated by a community mental health center respondent,

> Required Category 3 reports do not always reflect the program or its benefits.

The final theme of recommendations was for HHSC and CMS to be sensitive to contextual differences among organizations, communities, and regions. A private not-for-profit hospital respondent noted,

> The required performance for small hospitals is a real stretch – we do not have the same resources as the larger hospitals; yet we are held to the same level of expectations. If the program could make adjustments in the expectations for the various sized and type of hospitals, it would be helpful.

Respondents indicated a need for recognition and accommodation of rural-urban differences in the way health systems are organized and how they operate, as well as differences among different types and sizes of hospitals and how the rules and implementation of the program would affect them differently. The feedback from rural participants highlighted the sentiment that the program systematically advantaged the urban areas. For example, a respondent from a hospital district authority commented that HHSC needed to

> Understand the challenges of rural providers versus urban providers – we are not the same. Listen to the rural areas without bias. Urban Facilities take up too much of your time.

Table 19. Emergent Themes from Qualitative Analysis, Perceptions of DSRIP and Recommendations for Systemic Changes

Areas for Improvement	Recommendations
Need for improvement of DSRIP implementation	• Minimize changes • Clearly define expectations to reduce ambiguity • Simplify rules and reporting to reduce administrative burden • Provide less-compressed timelines for providers • Provide timely feedback and guidance for decision making • Provide timely release of funds • Involve new providers to meet community needs • Expand DSRIP menu to facilitate innovation • Improve communication and collaboration, especially by improving technical assistance
Desire for definition and clarification of outcome expectations	• Improve Category 3 outcome measures by accommodating differences in providers and projects • Align metrics across categories • Reduce changes to outcome measures
Necessity for HHSC and CMS to be sensitive to contextual differences among organizations, communities, and regions	• Recognize and accommodate hospital differences • Recognize and accommodate rural-urban differences

MODULE 3: PERSPECTIVES FROM NON-PARTICIPATING ORGANIZATIONS

The final module of the stakeholder survey was administered to those organizations who either did not participate in the Demonstration, or whose participation in the Demonstration did not include all of the components for which they were eligible (i.e., hospitals that participated in UC but not DSRIP). The questions in this module asked respondents about the factors affecting their participation, their perspectives on the opportunities and challenges of the Demonstration, and the extent to which they would be willing to participate in the future.

Respondent Profile

A total of 92 respondents provided feedback in Module 3 regarding opportunities and challenges of the Demonstration. Of these, the largest proportion (41%) identified their organization as something other than the predefined categories listed in the survey. Examples of the organization types listed by respondents included home health care organizations, universities, community-based non-profit organizations, and private citizens. Twenty (22%) of respondents were from advocacy groups or statewide organizations. Table 20 below summarizes the respondents by organization type.

Table 20. Respondent Organizational Affiliations, Module 3

Organization Type	Frequency	Percent
Advocacy group / statewide organization	20	22%
Private hospital	6	7%
Health plan	6	7%
Physician group	5	5%
County government	4	4%
School district	4	4%
Health department	3	3%
Hospital district / hospital authority	2	2%
City government	1	1%
Community mental health center	1	1%
Academic health science center	1	1%
Health district	1	1%
Public hospital	0	0%
Other	38	41%
Total	92	100%

The majority of respondents in this section of the survey did not participate in an RHP (96%). However, a small proportion (4%) identified as participating in one RHP, presumably as a UC provider.

Factors Influencing Participation in the Demonstration

Among respondents affiliated with organizations identified as eligible to participate in the Demonstration, there were a variety of reasons for which they did not participate. Some organizations did not participate because their projects were not approved, either by their RHP anchor institution or by HHSC/CMS (14%). Some did not want to participate in the Demonstration (12%), due to lack of or timeliness of information provided to them, a perception that only hospitals were eligible to participate, or for financial reasons. Others did not participate because they could not find IGT to support either their UC or DSRIP project(s) (10%). A small number of respondents indicated that they chose to only participate in UC for economic/financial reasons (7%). A large proportion (54%) of respondents cited other reasons for not participating, which included the limited flexibility of the Demonstration, problems with coordination during the planning phase, and uncertain eligibility.

Opportunities and Challenges of the Demonstration

Opportunities

Regarding the opportunities provided by the Demonstration, respondents identified three key themes. First, they recognized the improvement to the quality and overall value of services provided. Respondents commented specifically on the increased resources available through the Demonstration to meet community needs, and how the Demonstration expanded access to those services. A respondent from a statewide membership organization highlighted the opportunity for health care providers to use

> ...funding that was not otherwise available, with flexibility, to meet community need.

Second, respondents highlighted the opportunity for the Demonstration to attend to contextual differences within communities and regions that are significant to operations and outcomes. Although many rural stakeholders criticized the Demonstration for advantaging the urban providers, they praised the Demonstration's focus on local community needs and highlighted the opportunity for innovation in changing the way systems work. One respondent noted that the Demonstration allowed for

> ...creativity in solutions.

In its current structure, the Demonstration is both inadequately accommodating of the distinctive implementation constraints faced by rural providers, and more flexible in Demonstration design specifications, thus making significant innovations possible if rural providers can overcome those implementation constraints. Finally, respondents indicated a great deal of consensus in the opportunities afforded given the Demonstration's explicit focus on mental/behavioral health. A community mental health center respondent noted that the Demonstration provided

> ...expansion of mental health and substance abuse services in areas where funding was previously not available.

Challenges

Although stakeholders identified significant opportunities in the Demonstration, they also identified substantial challenges that should be considered in future iterations of the Demonstration. Five themes emerged with respect to challenges identified by Demonstration stakeholders: exclusion of certain types of providers, limited services could be offered through DSRIP, local politics, questions surrounding sustainability, and time needed to learn and implement a new system.

Many respondents commented on the exclusion of certain types of providers, such as residential mental health/substance abuse treatment facilities over 16 beds (the Institutions for Mental Diseases exclusion) and exclusion of specific services such as hospice as being a challenge. The fact that organizations providing critical ancillary services were not eligible to participate as performing providers was perceived by some respondents as limiting the effectiveness of the Demonstration. A hospice organization respondent stated,

> Several participants in the 1115 Medicaid waiver program, in particular some hospitals and clinics, have accessed funding, picked our brains as downstream providers, but not provided any funding to us to care for indigent/unfunded/underfunded patients they refer to us to help achieve their benchmarks.

Also, limiting the services that could be offered or expanded through DSRIP was perceived as stifling the innovations that may have otherwise been attempted.

Given the scope of the Demonstration and the substantial resources available, politics are unavoidable. Survey respondents expressed that competing agendas hindered the effectiveness of the Demonstration. Specifically, organizational agendas regarding the funding

structure, both at the state and regional levels presented challenges. A respondent from an advocacy group commented,

> Funding is much too focused at the hospital level and not available throughout the community.

Additionally, local, regional, and state politics affected who participated and how. For example, although oral health was included in the original DSRIP menu, dental providers were not eligible as performing providers. After some negotiation with HHSC, a dental school in one academic health science center was able to serve as a performing provider. Organizations ineligible to serve as a performing provider were able to partner with performing providers via subcontract. In some cases, this was viewed as unfair because performing providers received incentive payments, while subcontractors were only allowed fair market value of their services. One respondent from a physician group not affiliated with an academic health science center emphasized,

> Lack of collaboration between waiver 1115 funded organizations and other community organizations like mine limits…the full potential of the intent of the waiver 1115 program.

Survey respondents also acknowledged that local politics around IGT could be challenging, particularly when organizations with substantial funds were able to provide IGT for their own UC or DSRIP. In RHPs where a large public hospital or health district was also the anchor, some RHP members expressed a perception of them as having greater influence over the decision-making regarding what projects were accepted and funded. This was especially true in RHPs that housed both public and private hospitals because private hospitals had to seek out IGT for their UC and DSRIP. As stated by one private hospital representative:

> A weakness of [UC] is that the providers must be able to find and partner with IGT entities and many providers are in a situation where no or limited IGT sources are available resulting in no or limited UC funding.

Sustainability was seen as a challenge by stakeholders due to uncertainty about the future once the 5-year demonstration project period ended. Organizations' uncertainty about the sustainability of activities planned and initiated through DSRIP affected the degree to which they were willing to innovate. As stated by a respondent from a private, not-for-profit hospital,

> Participating in the DSRIP Project portion of the waiver required dedicated staff, with no guarantee of success.

The final theme related to challenges of the Demonstration was the time and effort needed to define and understand the new systems at work. Participants cited the need for more information from HHSC regarding: the timeline, how the systems were going to work, and intensity of effort required for organizations to participate in the Demonstration. One respondent from a statewide membership organizations noted *"the delay in getting program rules defined"* as a challenge of the Demonstration. These issues seem to be more related to start-up

challenges, though, because as of the time of the survey many of the reporting and monitoring systems were still being developed or tested and had not been deployed or institutionalized yet.

These challenges were identified by stakeholders as of mid-year, Demonstration Year 3, when the Demonstration was still fairly new and stakeholders were still learning about and acclimating to the new system.

Willingness to Participate in the Future

Respondents in this module were asked whether or not they would be willing to participate in the Demonstration in the future, should the opportunity be available. Of the 90 respondents, 47% stated that they *would be willing*, 41% indicated that they *might be willing*, and 12% noted that they *would not be willing* to participate.

RHP LEARNING COLLABORATIVES AS A QUALITY IMPROVEMENT TOOL

As part of the Demonstration activities, RHP members were encouraged to participate in learning collaboratives as a way to enhance quality improvement efforts. Although these activities do not fall under a unique evaluation goal or research question, the results are included with the stakeholder experience findings based on the inclusion of a variety of types of RHP stakeholders in the learning collaborative activities. The evaluation of the RHP learning collaboratives also is closely linked to activities under Evaluation Goal 9 and those under Evaluation Goals 6-8. Evaluation Goal 9 (see Appendix C) examines the RHPs to identify changes in collaboration brought about by the Demonstration and DSRIP specifically. Evaluation Goals 6-8 (see Appendix E) explore implementation of DSRIP projects across the state in an effort to evaluate project and patient outcomes.

Learning collaboratives are a model of shared learning that bring together teams of health care providers and other stakeholders to achieve quality improvement goals established by the team (Institute for Healthcare Improvement, 2003). Learning collaboratives are a core component of the Demonstration and are implemented through the Regional Healthcare Partnerships (RHP).

The guidance within the RHP Planning Protocol included key elements for learning collaboratives and continuous quality improvement (CQI) (provided by CMS), as well as optional project milestones and metrics to assist RHPs in measuring progress of their learning collaborative. On July 9, 2013, HHSC conducted a webinar, led by Fran Griffin with the Center for Medicare and Medicaid Innovation, on models for improvement collaboratives. The webinar covered improvement models such as the IHI Breakthrough Series Model and provided details on learning collaborative structure and implementation.

Under the Demonstration, RHPs categorized as Tier 1, 2, or 3 were required to develop region-wide learning collaboratives as a mechanism for quality improvement and inter-organizational learning across a region. Tier 4 RHPs were not required to lead a learning collaborative if the anchor institution did not have the administrative capacity to do so.

Tier 4 regions that did not develop their own learning collaborative had to submit plans for participating in the statewide learning collaborative or in another RHP's learning collaborative.

All 20 RHPs submitted a Learning Collaborative Plan during DY 2. RHPs that developed a learning collaborative were required to submit descriptions of the following:

- An overview of the learning collaborative;
- Aims/goals of the learning collaborative;
- Improvement model chosen for the learning collaborative;
- Structured leadership roles within the learning collaborative;
- Measurement plan for monitoring CQI processes and quality outcome data including Category 3 and Category 4 outcomes; and
- Learning system design.

DEMONSTRATION AND APPROACH TO EVALUATION OF RHP LEARNING COLLABORATIVES

The evaluation team conducted a descriptive evaluation of the Demonstration learning collaborative activities through review of the Learning Collaborative Plans and the Demonstration Year 3 RHP annual reports submitted by each RHP anchor institution.

The following data elements were extracted from the RHP Learning Collaborative Plans:

- Status of plan submission
- If the RHP is leading their own learning collaborative
- If DSRIP project funding was used for the learning collaborative
- If the RHP planned to participate in the learning collaborative activities of any other RHP(s)
- If the learning collaborative is open to outside members (e.g. outside RHP members or other regional stakeholders)
- The improvement model employed (e.g. IHI Breakthrough Series Model)
- The leadership structure within the learning collaborative
- If CQI partners were or would be engaged
- If there were defined management roles in the learning collaborative
- If member participation was required
- A summary of the measurement plan/strategy
- If designated topics were already defined in the plan (and, if yes, which topics?)
  - If there was a plan for identifying the first or new topics
- A summary of the learning collaborative process (e.g. how information was disseminated, planned frequency of meetings, etc.)
- If there was a schedule for first meeting

Information available in the narrative updates from the DY3 RHP annual reports had somewhat less consistency than what was available in the Learning Collaborative Plans. When available, the following were extracted:

- Number of learning collaborative groups formed
- Number of events

- Types of events (e.g. in-person meetings, webinars, teleconferences)
- Number of participants in events
- Topics addressed through the learning collaborative
- Any participation in learning collaborative activities of other RHPs
- Any updates to the Learning Collaborative Plan
- Identified measures
- Frequency of reporting on measures

When possible, the evaluation team coded numerically (e.g. documentation of whether an RHP is leading their own learning collaborative was coded as a 0 for *no* or 1 for *yes*). When numerical coding was not possible, the evaluation team conducted content analysis of descriptive summaries.

An updated list of approved DSRIP projects, including the newly approved 3-year projects, was also reviewed to identify if any RHP had a new approved DSRIP project related to their learning collaborative.[13] The list was reviewed specifically for projects under project option 1.10 – Enhance Performance Improvement and Reporting Capacity.

For the DY4 update, the evaluation team made suggestions for adding new questions related to the learning collaboratives to the DY4 report. HHSC included a set of those questions in the report and each RHP submitted responses to HHSC; data were then transferred to the evaluation team for analysis. The questions included:

- How many learning collaborative events did your RHP Learning Collaborative host during DY4 (October 1, 2014 – September 30, 2015)?
- Please describe how your RHP's Learning Collaborative(s) used the Plan-Do-Study-Act (PDSA), Plan-Do-Check-Act (PDCA), or other selected quality improvement process.
- Which specific measures is your RHP monitoring through its Learning Collaborative(s)?
- Please describe any challenges in administering, facilitating, or participating in a Learning Collaborative.
- Please describe strengths and challenges of the learning collaborative model as a tool for quality improvement within or for your RHP.

Finally, in the context of the case studies outlined to address Evaluation Goals 6-8 (see Appendix E), staff at different levels involved in DSRIP-funded care navigation projects were asked about their participation in any learning collaborative activities and whether they celebrated successes.

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[13] Approved project list available at https://www.hhsc.state.tx.us/1115-docs/050815/Active-DSRIP-Projects-with-Cat-3-20150505.xls (posted 5/8/2015).

Analyses

Excel spreadsheets were used to tabulate available quantitative data. Qualitative data such as summaries of learning collaborative activities, quality improvement topics, and identified measures, were content-analyzed for patterns of activities across RHPs. The responses from the comparative case studies were analyzed using ATLAS.ti qualitative software.

RESULTS

Overall Profile of RHP Learning Collaboratives

All 20 RHPs submitted Learning Collaborative Plans with details about their planned learning collaborative activities or their expected participation in other RHP learning collaboratives. The majority of RHPs (75%) submitted plans to lead their own learning collaborative. This includes all Tier 1, 2, and 3 regions, as well as five (50%) of the Tier 4 regions that were not required to lead their own learning collaborative if their administrative capacity was limited. Two Tier 4 regions implemented a "hybrid" model for their learning collaborative where they committed to implementing limited in-RHP learning collaborative activities (limited primarily by administrative capacity, but still focusing on core concepts of CQI), and providing opportunities for RHP members to actively participate in the learning collaborative activities of other RHPs. These implementation strategies are summarized in Table 21.

Table 21. Status of RHP Learning Collaborative Implementation Strategies (n=20)

Implementation Strategies	Number of RHPs
Led RHP Learning Collaborative	15
Developed Hybrid Model with Limited in-RHP Learning Collaborative Activities and Participation in Another RHP Learning Collaborative	2
Participated in Another RHP Learning Collaborative and/or the Statewide Learning Collaborative (eligible Tier 4 RHPs only)	3

Three of the RHPs indicated in their original Learning Collaborative Plan that they had an approved DSRIP project for their learning collaborative activities. Although the option for adding a 3-year project to support learning collaborative activities was made available, it does not appear that any RHPs received this additional funding.[14]

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[14] Approved project list available at https://www.hhsc.state.tx.us/1115-docs/050815/Active-DSRIP-Projects-with-Cat-3-20150505.xls (posted 5/8/2015).

Review of RHP Learning Collaborative Plans and Activities

This section summarizes the content of the Learning Collaborative Plans for those RHPs either leading their own learning collaborative or having developed a hybrid model with some in-region learning collaborative activities (n=17). All RHPs indicated plans to use the Institute for Healthcare Improvement Breakthrough Series Model with Plan-Do-Study-Act or Plan-Do-Check-Act cycles for CQI. RHPs reported engaging the models, or modifications of them, in their DY4 learning collaborative activities at the level of either the overall learning collaborative or, in some RHPs, at the provider level.

Learning Collaborative Leadership and Structure

The RHP anchor institutions provided administrative leadership for their learning collaboratives, including meeting planning, coordination of communication, and data monitoring. Some regions outlined structured staffing for their learning collaborative groups. For example, one RHP identified two separate learning collaborative groups, each with support from a director, project manager, coordinator, and an improvement advisor. Another RHP indicated they planned to hire a director to lead their learning collaborative activities. Seven of the RHPs indicated they had an executive or advisory committee responsible for learning collaborative oversight, with some helping to identify topics for the quality improvement efforts.

All RHPs planned to develop learning collaborative cohorts, workgroups, or quality improvement teams to implement learning collaborative activities. These groups were named differently across RHPs and, for the purpose of this report, are referred to as cohorts. The number of cohorts in an RHP tended to be related to the number of learning collaborative topics identified (see Table 22 and Table 23 for more information on the selected topics). These cohorts generally had an individual leading the quality improvement process; the leads were staff members from the RHP or volunteer performing provider representatives.

Learning Collaborative Participants

In general, participants in the RHP learning collaboratives included performing providers participating formally in the Demonstration through UC or DSRIP, or both. In eight of the RHPs, it was clear that RHP member participation was required. Others either stated that membership was voluntary or did not state either way. Performing providers participated as members of a learning collaborative group and, in some regions, served as group leaders.

Twelve RHPs noted their learning collaborative was open to outside members such as other stakeholders within their region (e.g. providers not formally participating in the RHP or Demonstration) and participants from other RHPs. This information was not specifically requested in the plan so this number may underestimate the number of learning collaboratives with open membership.

All RHPs that organized and hosted their own learning collaboratives reported learning collaborative activities during DY3 and DY4. The RHPs held in-person meetings, webinars, and/or teleconferences to conduct learning collaborative activities. Not all regions reported the

number of events held in DY3, but the range was wide as some RHPs held one to three events (primarily in-person) and others reported over 40 events (some in-person and others via teleconference) in DY3.

In DY4, RHPs reported a substantial amount of learning collaborative activity. A total of 151 in-person meetings were held across the state (mean: 7.5; median: 3; range across RHPs: 1 to 37). An additional 164 teleconferences and/or webinars were held (mean: 8.2; median: 6.5; range across RHPs: 1 to 30), and 23 other types of informal meetings (e.g. *ad hoc* group calls) occurred (mean: 1.21; median: 0; range across RHPs: 0 to 7).

In general, RHPs reported high levels of attendance at the learning collaborative events. For example, one RHP had 14 of 17 performing providers participate in their DY3 learning collaborative meeting, while another reported having over 350 participants from all across the state. However, the RHPs reported challenges related to maintaining momentum and engagement in learning collaborative activities, particularly when the learning collaborative goals did not directly align with provider goals and objectives, or their current priorities. One RHP described,

> Learning Collaborative activities are valuable and truly capture the spirit of the waiver as providers work together on system-level issues which are often outside the bounds of their specific DSRIP projects. Committing time and resources to these "above and beyond" endeavors can be challenging for providers and anchors.

Another noted,

> Our performing providers wear many hats so finding time to dedicate to preparation can be a challenge.

Other RHPs expressed similar challenges, particularly those with a larger number of rural providers. One rural RHP stated,

> It has been challenging to garner cohort participation from the providers…Part of this challenge is that [many] providers…are rural and wear many hats; therefore, they may not have the time and resources to add even more to their plate. This leads us to find creative ways to meeting the learning collaborative goals for our region while addressing the needs of the regional providers.

The same RHP reported modifying their Learning Collaborative Plan to include a "DSRIP Road Trip" to take learning collaborative activities into rural communities and engage more providers.

To address challenges such as these, and to accommodate travel challenges in RHPs with large geographies, several RHPs reported expanding their use of webinars to engage providers more routinely.

The three Tier 4 RHPs that did not lead their own regional learning collaborative each participated in the learning collaboratives of other RHPs and/or in the Statewide Learning

Collaborative held in September 2014. One of these RHPs participated in the learning collaborative activities of a nearby RHP; another participated in the activities of four other RHPs. Despite not formally organizing a learning collaborative, the third RHP reported holding meetings for participating performing providers to share information and participate in group problem solving to address challenges.

Learning Collaborative Topics

In DY3, 12 of the RHPs identified learning collaborative topics in their plan. The number of identified topics ranged from one to five, with some regions having a very specific clinical focus area (e.g. specialty care access) and others identifying systems and processes as targets for quality improvement (e.g. increasing community and patient engagement). In total there were 19 topic areas identified among the 12 RHPs (see Table 22). Four RHPs identified improving patient and community engagement as a topic area – the only topic with greater than three RHPs identifying it as a focus. Access to primary care; patient care navigation; and DSRIP project implementation, strategic planning, and/or reporting were identifying by three RHPs. The remaining topics were identified by only one or two RHPs as focus areas.

Table 22. Quality Improvement Topics Identified in the RHP Learning Collaborative Plans, DY3

Learning Collaborative Topic	Number of RHPs Designating Topic
Improve patient and community engagement	4
Access to primary care	3
Care navigation	3
DSRIP project implementation, strategic planning, and/or reporting	3
Behavioral health access and/or integration	2
Care transitions	2
Chronic care prevention and management	2
All-cause 30 day readmission rates	1
Diabetes in adult patients	1
Emergency department utilization	1
Health promotion and disease prevention	1
Measurement strategies	1
Medical homes	1
Palliative care	1
Potentially preventable readmissions	1
Primary care expansion	1
Right care, right setting	1
Specialty care access	1
Tele-health/tele-psychiatry	1

In RHPs where learning collaborative topics were not identified (n=5) as of DY3, the plan included a process for identifying the learning collaborative topics for their region. This typically included a process through which the advisory body would identify DSRIP project areas undertaken by a majority of performing providers in the region, and select those as topics for the learning collaborative. Other RHPs suggested there would be a process for engaging RHP members in identifying topics.

By DY4, RHPs were reporting more topics of focus within their learning collaboratives. Table 23 summarizes the topics reported by RHPs and represents a marked increase in the number of topics RHPs reported in their learning collaborative activities compared to DY3. Most RHPs,

through their own learning collaborative or participation in other RHP learning collaboratives, focused on behavioral health access and integration, chronic care prevention and management, access to primary care, and care navigation. The observed increase in topic areas may be due at least partially to how the data were collected and documented. For DY3, the data were pulled from existing documents and topics were only documented where RHPs reported them. For DY4, RHP anchors were specifically asked for their topics, which may have led to more being reported.

Table 23. Quality Improvement Topics Identified in the RHP Learning Collaborative Plans, DY4

Learning Collaborative Topic	Number of RHPs Designating Topic
Behavioral health access and/or integration	18
Chronic care prevention and management	16
Access to primary care	15
Care navigation	15
Improve patient and community engagement	14
Diabetes in adult patients	14
Health promotion and disease prevention	13
Primary care expansion	13
Tele-health/tele-psychiatry	13
Care transitions	12
Emergency department utilization	12
Right care, right setting	11
Palliative care	10
Specialty care access	10
All-cause 30 day readmission rates	9
Potentially preventable readmissions	9
Medical homes	8
Measurement strategies	7
DSRIP project implementation, strategic planning, and/or reporting	3
Others (including culturally competent care, school-based health, patient experiences, process improvement strategies, and regional collaboration)	6

RHP anchors reported challenges in identifying a single topic that was applicable to all providers, which could facilitate provider engagement. This challenge could explain why there was an observed increase in the number of topics included in each RHPs learning collaborative activities in DY4. Several RHPs noted in their DY4 report that the learning collaborative model was particularly useful when there were similarities in the projects each provider undertook.

RHPs reported that the regional learning collaboratives were most successful in encouraging collaboration, sharing knowledge and ideas, and initiating joint problem solving where challenges were identified. RHP anchors indicate that the learning collaboratives are, indeed, a learning community for their providers, particularly when there is a topic applicable to more than one.

Learning Collaborative Measurement Strategy

The RHPs had varying strategies for data measurement, and each had differing levels of specificity outlined in the Learning Collaborative Plan. The RHPs that had not yet identified learning collaborative topics did not outline specific measures, but most noted that they would identify measures based on the topics eventually selected. Most of these RHPs indicated a plan to focus on Category 3 and/or Category 4 measures.

Among those RHPs having already selected topics for their learning collaborative in DY3, the measurement strategies typically included routine data submission (generally monthly or quarterly) on Category 3 or Category 4 measures common to most of the performing providers, or measures specific to their topic area. When multiple measures may be available, some RHPs planned to leave the specific measurement plan up to the learning collaborative cohorts, with some general guidelines provided (e.g. that each cohort would select one to three measures to report). Not all RHPs reported on quality, health, and cost measures in their DY3 Annual Report. This is likely due to DY3 being the first year in which most learning collaborative activities were implemented, with all RHPs expecting these activities to extend into DY4 and DY5.

In the DY4 annual report, RHP anchors reported on the measures used in the learning collaborative to monitor quality improvement. A total of 28 measures, some more specific than others, were reported across all RHPs, including:

- Percent of patients who received the teams' selected integrated care intervention in the past 12 months
- Percent of patients receiving integrated care whose condition improved
- 30-day readmissions
- Emergency department utilization
- Percentage of patients screened with team's selected cross-specialty screening
- Patient navigation
- Improved access to care
- Client satisfaction questionnaire
- Health promotion / referral to a diabetes education class
- Expanding clinic hours
- Increase in PCP's
- Initiation and engagement of alcohol or drug dependence treatment
- Gonorrhea follow-up testing
- Completion of health and wellness class
- Strategic planning and sustainability

- Percent of discharged patients who received written discharge summary
- Percent of discharged patients whose follow-up provider received summary within 7 days
- Percent of discharged patients with community provider contact within 7 days
- Percent who received contact with follow-up care coordinator team within 30 days of health material dissemination to follow up with its use of information
- Lowering A1C
- Lowering Blood Pressure
- Lowering Weight
- Annual Eye Exams
- Annual Foot Exams
- Tele psychiatry - transfer decision time
- Palliative Care - pain management, treatment preferences
- Collaborations
- Breast cancer advocacy

The mechanism by which reporting occurred also varied by RHP. Some RHPs indicated they already used web-based data management systems that would allow performing providers to submit and review data electronically. Other RHPs suggested that they would prepare data collection tools for use in the learning collaborative. Of importance is that some RHPs report continued challenge in obtaining data from providers, due primarily to time constraints and limited financial incentive for providers.

Findings from the Comparative Case Study

Under Evaluation Goals 6-8, a comparative case study design was utilized to evaluate implementation of DSRIP-funded patient care navigation projects at 10 sites across the state. The case study included interviews with key project informants, patient care navigators, and other front-line staff at organizations implementing projects related to reducing emergency department use among high utilizing patients. In these interviews, key informants (typically executives) were asked, "Is this project involved in any [1115] waiver-related learning collaboratives?" and project staff were asked, "Do you compare what you're doing in care navigation with any other organizations? Share best practices?" Based on responses to these two questions, the following summarizes findings from these questions (a complete summary of case study findings are available in Appendix E):

- Three sites mentioned that the learning collaboratives had been helpful in developing their programs and getting information on how others have accomplished a shared goal. For example, one site representative noted,

    > We really believe in the learning collaboratives that are being promoted by
    > all the regions to the anchors. We certainly participate actively in those.
    > Those have been very helpful because we do know that we're not the only
    > ones doing this. … We want to hear how they are doing things.

- Of those that did participate in learning collaboratives, at the time of the initial site visits (fall 2013 to fall 2014) most had "*corporate level*" participants versus front-line staff, although in follow-up interviews front-line staff have more commonly mentioned such participation.
    - During the initial site visits, most patient care navigators did not participate or know what a learning collaborative was. One care navigator when asked "Have you been involved in any 1115 waiver related learning collaborative?" responded with "*What is that?*"
    - Only two sites had care navigators and front-line staff involved in learning collaboratives.
- One small non-system site responded that they did not participate in learning collaboratives.
- Learning collaborative information, at times, may be hard to understand and disseminate broadly.
- One large urban hospital system has a team that listens to the learning collaborative calls and provides the rest of the group with any useful information regarding DSRIP project activities. However, they noted that the information may not always translate well to those not actively participating in the learning collaborative, stating,

They're very useful. The only thing is, sometimes, what we do is we
participate; we listen. Then we let our team digest it a little bit for us, and
then give us the DSRIP for Dummies book. Even sometimes that language
just escapes me.

CONCLUSIONS

The data collected and analyzed related to Evaluation Goals 10 & 11 provide substantial insight
into stakeholders' experience with the Demonstration and its implementation. A summary of the
findings is presented as it correlates to the research questions guiding the evaluation.

RQ1: To what extent do RHP members perceive the RHPs to be an effective structure for
implementation of the Demonstration?

Overall, RHP members were satisfied with their RHP and how it operates to facilitate
their participation in the Demonstration. Members overall expressed satisfaction with
their anchor institution's leadership and guidance, as well as the anchor institution's
effectiveness in providing information and managing meetings. However, there is
variation among RHPs with a few less satisfied among their members. Communication
within the RHPs was generally seen as productive by the members.

RQ2: To what extent do RHP members perceive the decision-making and conflict resolution
processes of their RHP to be effective?

RHP members indicate, for the most part, that they were involved in the early
development of their RHP, including participation in designing the goals and objectives
of the RHP plan and determining the RHP governance structure. RHP members
perceive CMS, HHSC, and anchor institution staff as having the most influence in
decision making for the RHPs, with member organizations having less influence and
other local stakeholders having the least influence. Results indicate some tension within
the RHPs, but this tension is limited; and given the demands of the Demonstration and
the funds involved, some tension should be expected. Regarding conflict resolution, two-
thirds (66%) of RHP members responding said that their RHP had set ground rules for
working together as part of the organizational structure, and 82% reported that they had
established mechanisms for providing feedback.

RQ3: What do RHP members and other key stakeholders perceive to be the strengths and
weaknesses of the Demonstration, and what recommendations do they offer for
changing MMC, UC, or DSRIP?

Stakeholders identified key strengths of the Demonstration, including increases in
available funding, the opportunity for innovation, the emphasis on public-private
partnerships, and systems for accountability. Key weaknesses identified by stakeholders
included timing of implementation, the changing rules and expectations, the exclusion of
certain types of providers, lack of infrastructure at multiple levels, the broad scope of
Demonstration activities, the limited project "menu," and the politics involved at the local

and state levels. Further, there appear to be challenges in measuring Demonstration outcomes for some stakeholders that perceive most Demonstration metrics as clinically-focused and inapplicable to providers such as health departments. Overall recommendations focused on developing rules, reporting mechanisms, and payment schedules ahead of time; limiting Demonstration changes, decreasing administrative burden; addressing differing implementation challenges faced by urban and rural (or large and small) hospitals; and maintaining a focus on long-term sustainability.

RQ4:   For organizations eligible to participate that did not participate, what factors influenced their decision? What do these organizations perceive to be the opportunities and challenges of the Demonstration?

Organizations that were eligible to participate but did not participate cite several factors influencing that decision, including projects not being approved, lack of or timeliness of information provided to them, financial reasons including the inability to find IGT, the limited flexibility of the Demonstration, problems with coordination during the planning phase, and uncertain eligibility. These organizations noted increased resources, the ability to improve quality of services, and the focus on local health systems as opportunities for the Demonstration. Identified challenges included the lack of timely information about the Demonstration, the exclusion of certain providers, and competing political agendas.

The survey indicates that Demonstration stakeholders are generally satisfied with how the program has been implemented and with their experiences during implementation, despite start-up issues. Key stakeholder concerns and recommendations for going forward focus on streamlining processes, timelines, and payment schedules; eliminating frequent changes; recognizing and addressing the unique implementation challenges of different types of providers; and including more provider types that were previously excluded.

RHP Learning Collaboratives

The RHP learning collaboratives varied in terms of quality improvement topic areas and in implementation and measurement strategies, suggesting that learning collaborative activities were focused to meet regional provider needs. All RHPs hosted their own and/or participated in learning collaborative activities of other regions. RHP reports indicate that the learning collaboratives are experiencing high levels of participation, but the anchors report challenges in maintaining this when providers face a number of priorities in terms of project implementation and reporting, time constraints, and lack of financial incentives for participation and data sharing.

As the learning collaboratives were implemented, more topics were included, presumably to accommodate the fact that there were a variety of provider interests based on their DSRIP projects. Similarly, RHP learning collaboratives identified more specific measures of improvement in DY4, reflecting a motivation to follow the quality improvement models employed. According to the RHP anchors, the learning collaboratives have been most useful in encouraging new partnerships, facilitating the sharing of new knowledge, and encouraging

collective problem solving to address challenges. The case study results indicate that learning collaborative participation may be more at the management level of organizations than at the project level, and that communication between these levels may not always be productive when sharing information for and about the learning collaboratives. As of the date of this report, no specific outcome measures from the learning collaboratives were available for reporting.

Limitations

This element of the Demonstration evaluation has limitations. The overall response rate for the Stakeholder survey was low (8%), which may limit the ability for inference and generalization across all stakeholders. Even so, the total number of respondents was 533 and there were at least seven respondents from each of the pre-determined stakeholder groups. However, among these groups, those with the lowest number of respondents also have a smaller number of organizations participating in the Demonstration overall. A second limitation of the survey is that it was distributed to RHP members in the midst of many other Demonstration requirements. Adding a survey on top of other Demonstration priorities may have contributed to the low response rate. Finally, there were variable response rates between RHPs, making RHP-specific results vulnerable to extreme responses when there was a low response rate for that RHP.

Regarding the learning collaborative evaluation, with the exception of the case study analysis, this evaluation of the learning collaboratives focuses primarily on document review and annual reporting to HHSC. The Learning Collaborative Plans included consistent information across RHPs, allowing for a more structured analysis of the elements of the planned learning collaborative activities. The DY3 Annual Reports were highly variable, with some including extensive details about learning collaborative activities and others only referencing activities that occurred. This limits the current review by preventing a full analysis of activities across all RHPs. The DY 4 reports were more structured with targeted questions, although the responses were, again, varying in detail and specificity across RHPs.

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INSTRUMENTS

RHP Member and Stakeholder Survey: Instrument

Thank you for participating in this survey! The purpose of the survey is to understand your organization's experience with and perspectives of the Texas 1115 Medicaid Waiver Program. Your organization may be participating in one or more roles, including as a regional healthcare partnership (RHP) anchor, as an intergovernmental transfer (IGT) entity, as a hospital participating in the Uncompensated Care program, or as a DSRIP performing provider. Your organization may also be a stakeholder impacted by the Waiver Program, but not serve in an official role within an RHP.

The survey should take approximately 15-30 minutes to complete. You received a copy of the study Information Sheet in the original email inviting you to participate in this survey. You can also view the information sheet here [LINK].

Some Helpful Definitions

1115 Waiver Program: The Texas Healthcare Transformation and Quality Improvement Program demonstration waiver under §1115a of the Social Security Act. Through this Program, Texas Health and Human Services Commission (HHSC) is able to utilize Medicaid funding in new/innovative ways.

Regional Healthcare Partnership (RHP): A collaboration of interested participants that work collectively to develop and submit to the state a regional plan for health care delivery system reform. RHPs will support coordinated, efficient delivery of quality care and a plan for investments in system transformation that is driven by the needs of local hospitals, communities, and populations.

Anchor: The governmental entity identified by HHSC as having primary administrative responsibilities on behalf of a Regional Healthcare Partnership (RHP).

Delivery System Reform Incentive Payment (DSRIP): An incentive payment related to the development or implementation of a program of activity that supports an RHP's efforts to enhance access to health care, the quality of care, and the health of patients and families the RHP serves. A DSRIP payment is not considered patient-care revenue and is not offset against Disproportionate Share Hospital expenditures or other expenditures related to the cost of patient care.

Uncompensated Care (UC) pool: Funding available to certain RHP participants, as well as dental and ambulance providers, under the waiver to defray uncompensated care costs.

Waiver Activities: Activities undertaken by RHP participants to meet the goals of the 1115 Waiver Program and the RHP plan. This includes activities under Delivery System Reform Incentive Payment (DSRIP) and Uncompensated Care (UC).

Relevant Acronyms

CMS: Centers for Medicare and Medicaid Services
HHSC: Texas Health and Human Services Commission
MCO: Managed care organization
PBM: Pharmacy benefits manager

Please click here [LINK] to begin the survey.

SCREENING QUESTIONS

1. Please indicate which of these categories *best* describes your organization:

   - County government
   - City government
   - Hospital district / hospital authority
   - Public hospital
   - Private, not-for-profit hospital
   - Private, for-profit hospital
   - Physician group affiliated with an academic health science center
   - Physician group not affiliated with an academic health science center
   - Community mental health center
   - Health department
   - Academic health science center
   - Health district
   - School district
   - Health plan
   - Advocacy group/organization
   - Statewide membership organization
   - Other: _____

2. Which of the following *best* describes your organization's role in the Waiver Program?
   a. My organization does not participate in the Texas Medicaid 1115 Waiver through an RHP [if selected, proceed to Module 2]
   b. My organization participates in one RHP [proceed to Module 1]
   c. My organization participates in more than one RHP [proceed to Module 1, which will repeat for each RHP]

3. How is your organization participating in the 1115 Waiver Program? [select all that apply]
   - DSRIP
   - UC
   - IGT
   - Anchor
   - My organization was not eligible to participate [if selected, proceed to Module 2]

4. Of which RHP(s) are you a member? [LIST ALL 20 – select all that apply]

Module 1 - RHP Member Survey

	APPROVE	RECOMMEND	DEVELOP	ADVISE	NO ROLE	DON'T KNOW
1. What was the role of the RHP members in designing the goals and objectives of the RHP plan?	☐	☐	☐	☐	☐	☐
2. What was the role of the RHP members in determining the governance structure of the RHP?	☐	☐	☐	☐	☐	☐

	YES	YES BUT LIMITED	NO	DON'T KNOW
3. Did the anchor (INSERT anchor name) provide *leadership* in the *initiation* of the RHP?	☐	☐	☐	☐
4. Did the anchor (INSERT anchor name) provide *guidance* in the *initiation* of the RHP?	☐	☐	☐	☐
5. Does the anchor (INSERT anchor name) provide *leadership* in the *ongoing operations* of the RHP?	☐	☐	☐	☐
6. Does the anchor (INSERT anchor name) provide *guidance* in the *ongoing operations* of the RHP?	☐	☐	☐	☐
7. Does the anchor (INSERT anchor name) provide *accurate* knowledge regarding Waiver activities?	☐	☐	☐	☐
8. Does the anchor (INSERT anchor name) provide *timely* knowledge regarding Waiver activities?	☐	☐	☐	☐
9. Does the anchor (INSERT anchor name) provide you with *accurate* technical assistance?	☐	☐	☐	☐
10. Does the anchor (INSERT anchor name) provide you with *timely* technical assistance?	☐	☐	☐	☐

	VERY EFFECTIVE	SOMEWHAT EFFECTIVE	MOSTLY INEFFECTIVE	COMPLETELY INEFFECTIVE
11. To what extent is the anchor (INSERT anchor name) effective in getting you *accurate* information?	□	□	□	□
12. To what extent is the anchor (INSERT anchor name) effective in getting you *timely* information?	□	□	□	□
13. To what extent is the anchor (INSERT anchor name) effective in managing meetings?	□	□	□	□
14. How would you describe your anchor's (INSERT anchor name) role in **development** of your RHP plan? [open-ended]				
15. How would you describe your anchor's (INSERT anchor name) role in **implementation** of your RHP plan? [open-ended]				

	YES	NO	DON'T KNOW
16. Does the RHP have documented procedures for decision-making? (*Florin et al, 2000*)	□	□	□
17. Did the RHP set ground rules for working together? (*Taylor, 1998*) – POSSIBLE DELETE	□	□	□
18. Does the RHP have written agendas at meetings? (*Florin et al, 2000*) – POSSIBLE DELETE	□	□	□
19. Does the RHP have a mechanism for monitoring RHP activities? (*Taylor, 1998*)	□	□	□
20. Does the RHP have a mechanism for members to provide feedback? (*Taylor, 1998*)	□	□	□

	VERY SATISFIED	SOMEWHAT SATISFIED	SOMEWHAT DISSATISFIED	COMPLETELY DISSATISFIED
21. Overall, to what extent are you satisfied with the RHP's progress towards addressing community needs?	□	□	□	□
22. To what extent are you satisfied with the RHP's level of commitment to *all* partners having an opportunity to participate?	□	□	□	□
23. To what extent are you satisfied with the RHP leadership's level of	□	□	□	□

commitment to listen to the ideas and opinions of people/organizations involved in the RHP?	

24. How important or unimportant to your RHP is each of the following ways of communication?

	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT VERY IMPORTANT	NOT AT ALL IMPORTANT
Mailed, emailed, and faxed written materials	□	□	□	□
Verbal reports at RHP meetings	□	□	□	□
Group discussions at RHP meetings	□	□	□	□
Informal communication outside of RHP meetings	□	□	□	□
Distributions of materials/information via RHP website	□	□	□	□
Distribution of materials/information via social media	□	□	□	□
Reports and/or communication via webinars	□	□	□	□
	VERY FREQUENT	**SOMEWHAT FREQUENT**	**MOSTLY INFREQUENT**	**COMPLETELY INFREQUENT**
25. Please rate the *frequency* of communication **between** anchor (INSERT anchor name) staff **and** RHP members	□	□	□	□
26. Please rate the *frequency* of communication **among** RHP members	□	□	□	□
	VERY PRODUCTIVE	**SOMEWHAT PRODUCTIVE**	**MOSTLY UNPRODUCTIVE**	**COMPLETELY UNPRODUCTIVE**
27. Please rate the *productivity* of communication **between** anchor (INSERT anchor name) staff **and** RHP members	□	□	□	□
28. Please rate the *productivity* of communication **among** RHP members	□	□	□	□

29. To what extent have you noticed the following causing tension **among** RHP members:				
	A LOT OF TENSION	**SOME TENSION**	**VERY LITTLE TENSION**	**NO TENSION**
Differences of opinion	□	□	□	□
Personality clashes	□	□	□	□

	□	□	□	□
Hidden agendas	□	□	□	□
Power struggles	□	□	□	□
Imbalance of power	□	□	□	□
Unequal distribution of resources	□	□	□	□
Historical relationships	□	□	□	□
Inability to reach consensus	□	□	□	□

30. To what extent have you noticed the following causing tension **between** the anchor **and** RHP members:

	A LOT OF TENSION	SOME TENSION	VERY LITTLE TENSION	NO TENSION
Differences of opinion	□	□	□	□
Personality clashes	□	□	□	□
Hidden agendas	□	□	□	□
Power struggles	□	□	□	□
Imbalance of power	□	□	□	□
Unequal distribution of resources	□	□	□	□
Historical relationships	□	□	□	□

31. How much influence do various groups of people have in making decisions for the RHP? For each group listed below, check the answer that reflects how much influence you think that group has in deciding on the actions and policies of your RHP.

	A LOT OF INFLUENCE	SOME INFLUENCE	NOT MUCH INFLUENCE	NO INFLUENCE	I DON'T KNOW
Staff of the RHP member organizations	□	□	□	□	□
Anchor (INSERT anchor name) staff	□	□	□	□	□
The Health and Human Services Commission (HHSC) Waiver Team	□	□	□	□	□
Other local stakeholders in your region	□	□	□	□	□
Centers for Medicare and Medicaid Services (CMS)	□	□	□	□	□

	AGREE	SOMEWHAT AGREE	SOMEWHAT DISAGREE	DISAGREE
32. The RHP is increasing collaboration among organizations in the region to increase access to health services. (*new measure*)	□	□	□	□

	BENEFICIAL	SOMEWHAT BENEFICIAL	NOT BENEFICIAL
33. How beneficial do you believe Waiver activities implemented by your RHP are for the residents of your community? (*new measure*)	□	□	□

Module 2 - Survey on Program Strengths, Weaknesses, and Recommendations

The following questions ask about your organization's involvement with several components of the Texas Medicaid 1115 Waiver Program, and the strengths and weaknesses of the changes associated with them. The following Waiver Program components are included.

Medicaid Managed Care Expansion: On March 1, 2012, HHSC implemented changes to the delivery of Medicaid and the Children's Health Insurance Program (CHIP) services.
> These changes included:
> - The expansion of the STAR and STAR+PLUS Medicaid Managed Care programs to new areas of the state. STAR provides health services for pregnant woman, children with limited income, and TANF clients. STAR+PLUS provides acute and long-term services and supports to the aged and disabled.
> - Transition of approximately 880,000 clients from the Primary Care Case Management (PCCM) program into managed care.
> - Prescription drug benefits, currently administered through HHSC's Vendor Drug program, are now delivered though the Medicaid and CHIP managed care organizations.
> - Medicaid children's dental benefits are now delivered through by managed care organizations.

Uncompensated Care (UC): Uncompensated care includes the costs of uncompensated care provided to Medicaid eligibles or to individuals who have no funds or third party coverage for services provided by the hospital or other providers. UC and the DSRIP funds available under the 1115 Waiver Program replaced funding available under the former Upper Payment Limit (UPL) program.

Delivery System Reform Incentive Payment (DSRIP): DSRIP funds within the Waiver Program allow for incentive payments for projects to enhance access to health care, increase the quality of care, the cost-effectiveness of care provided and the health of the patients and families served. Projects eligible for incentive payments must come from the DSRIP menu, be included in an HHSC and CMS-approved RHP plan, have a source of IGT, and have corresponding metrics and milestones.

Screening Questions:

1. Does your organization provide Medicaid services?

   Yes/No

2. What is the zip code of your organization/clinic/practice? (If more than 1 location, please select your primary location and answer the following questions with that location in mind.)

3. Is your organization affected by: (check all that apply)

Medicaid Managed Care expansion under the Waiver, specifically through:	
Expansion of STAR+PLUS to your area	Yes / No
Expansion of STAR to your area	Yes / No
Addition of pharmacy benefits to Medicaid managed care	Yes / No
Addition of Medicaid children's dental services to managed care	Yes / No

Uncompensated Care (UC)	Yes / No
Delivery System Reform Incentive Payment (DSRIP) Program	Yes / No

If [YES] to any portion of MMC (REPEAT FOR ALL MMC YESs]:

1. For the options below, please indicate if you feel there has been an improvement, that things have stayed the same, or if there has been a decline related to Medicaid Managed Care expansion. Answers may vary according by Managed Care Organization. Please respond based on your overall experience. You may use the fifth column to provide specific comments.

	Improved	Stayed the same	Declined	I do not have enough information to answer this question (I don't know)	Comments:
Timeliness of claim payments	☐	☐	☐	☐	
Pharmacy benefits manager (PBM)	☐	☐	☐	☐	
Provider network	☐	☐	☐	☐	
Access to prescription drugs	☐	☐	☐	☐	
Patient adherence to prescription drugs	☐	☐	☐	☐	
Value added benefits for clients	☐	☐	☐	☐	
Administrative burden	☐	☐	☐	☐	
Claims processing	☐	☐	☐	☐	
Patient access to services provided	☐	☐	☐	☐	
Quality of services provided	☐	☐	☐	☐	
Cost of services provided	☐	☐	☐	☐	
Coordination of care among service providers	☐	☐	☐	☐	

Please describe any strengths and weaknesses of Medicaid Managed Care expansion, including expansion of STAR, STAR+PLUS, addition of pharmacy and children's dental services, here:
        [Open-ended]

2. What recommendations do you have for changing Medicaid Managed Care to improve operations and outcomes?
        [Open-ended]

If [YES] to UC:
3. In your opinion, what are the strengths of the Uncompensated Care program compared to the Upper Payment Limit (UPL) program?
        [Open-ended]
        Include response option of "I don't have enough information to answer this question"

4. In your opinion, what are the weaknesses of the Uncompensated Care program compared to the Upper Payment Limit (UPL) program?

[Open-ended]

Include response option of "I don't have enough information to answer this question"

What recommendations do you have for changing the Uncompensated Care program to improve operations and outcomes?

[Open-ended]

If [YES] to DSRIP:

1. For the options below, please indicate if you feel the option is a strength or weakness of DSRIP. You may use the fourth column to provide specific comments.				
	Strength	**Weakness**	**I do not have enough information to answer this question (I don't know)**	**Comments:**
Collaboration with other organizations in the area/community	□	□	□	
Opportunity to design innovative projects	□	□	□	
Opportunity for system reform	□	□	□	
Resources to hire more staff	□	□	□	
Resources to serve more patients/clients	□	□	□	
Clear expectations	□	□	□	
Communication between RHPs and the state	□	□	□	
Health services/programs in the community	□	□	□	
Project limitations	□	□	□	
Timeliness in funding	□	□	□	
Unclear expectations/changing expectations	□	□	□	
Reporting	□	□	□	
Opportunity for infrastructure improvement/change	□	□	□	
Improved patient outcomes	□	□	□	
Quality of health services programs	□	□	□	
Access to health services programs	□	□	□	
Cost of health services programs	□	□	□	

Please list other strengths and weaknesses here:

2. What recommendations do you have for changing DSRIP to improve operations and outcomes?
   [Open-ended]

Final Question, regardless of module(s) completed:
3. Would you be willing to be contacted to participate in a short follow-up phone interview?
   [Y/N]
   If [YES]:
   May I have your phone number and email address?

Module 3 - Survey of Non-Participant Views on the Waiver Program

In the following section, you'll be asked about your participation in the Waiver Program, the greatest opportunities and challenges presented by the Waiver Program, and your willingness to participate in Waiver activities in the future.

1. What factors influenced your organization's participation in the Waiver Program?
   - My organization could not find IGT to support our Uncompensated Care
   - My organization could not find IGT to support our proposed DSRIP project(s)
   - Our proposed project(s) were not approved by the anchor
   - Our proposed project(s) were not approved by HHSC / CMS
   - My organization did not want to participate (open-ended f/u question asking why?)
   - More economical to participate in uncompensated care (UC) only and not DSRIP
   - Other [open-ended f/u question asking for more detail]
   -
2. What do you see as the greatest opportunities the Waiver Program provides?
   [Open-ended]
3. What do you see as the greatest challenges related to the Waiver Program?
   [Open-ended]
4. If there were an opportunity to participate in the Waiver Program in the future, would your organization be interested?
   a. Yes
   b. Maybe
   c. No

Final Question, regardless of module(s) completed:

5. Would you be willing to be contacted to participate in a short follow-up phone interview?
   [Y/N]
   If [YES]:
   May I have your phone number and email address?

APPENDIX E:
EFFECTS OF DSRIP ON HEALTH CARE QUALITY, POPULATION HEALTH, AND COSTS

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BACKGROUND

DELIVERY SYSTEM REFORM INCENTIVE PAYMENT (DSRIP)

The Delivery System Reform Incentive Payment (DSRIP) program is intended to incentivize hospitals and other providers to transform their healthcare service delivery practices. These payments motivate hospitals and other providers to develop programs or strategies to enhance access to healthcare and increase: the quality of care, the cost-effectiveness of care provided, and the health of the patients and families they serve. Projects eligible for incentive payments must be selected from a menu of Centers for Medicare and Medicaid Services (CMS) and the Texas Health and Human Services Commission (HHSC) approved project options, be included in the Regional Healthcare Partnership's (RHP) plan, and have corresponding metrics and milestones.

The Texas DSRIP program was modeled after the DSRIP program implemented through the California *Bridge to Reform* section 1115(a) Medicaid waiver approved by CMS on November 1, 2010. Although Texas did utilize information from California's DSRIP program, there are many differences: including private hospital participation, the addition of physician practices, community mental health centers, and local health departments. In contrast, California's DSRIP program was implemented through 21 designated public hospital systems (DPHs). DSRIP projects included outpatient, inpatient, primary/preventative, and specialty care that corresponded with four project categories: infrastructure development, innovation and redesign, quality improvements; and population-focused improvements.

Across the five-year demonstration, the Texas Demonstration made available $11.4B in federal funds for DSRIP projects. To distribute these funds, HHSC and CMS required hospitals, stakeholders, and performing providers to collaborate to form RHPs. These RHPs administer the Program at the local level and facilitate system transformation.

Each RHP is anchored by a public hospital or other public entity and includes all organizations participating in the Demonstration including hospitals and performing providers. As of 2016, across all RHPs there were 336 DSRIP performing providers. These included hospitals (non-state owned public, state-owned public, and private), physician groups (mostly affiliated with academic health science centers), community mental health centers, and local health departments. Some performing providers provide services in multiple RHPs and are included in the totals for each RHP (Table 1).

Table 1. Regional Healthcare Partnership (RHP) Anchors, Number of Projects, Number of Performing Providers, and Major RHP Cities

RHP	Anchor	Total Number of Projects	Total Number of Providers	Major cities in the RHP
1	University of Texas Health Science Center at Tyler	91	25	Tyler, Longview, Texarkana
2	University of Texas Medical Branch	83	14	Beaumont, Galveston
3	Harris Health System	177	26	Houston
4	Nueces County Hospital District	88	20	Victoria, Corpus Christi
5	Hidalgo County	78	13	McAllen
6	University Health System	124	25	San Antonio
7	Travis County Healthcare District (Central Health)	76	9	Austin
8	Texas A&M Health Science Center	40	12	Killeen
9	Dallas County Hospital District (Parkland Health and Hospital System)	129	25	Dallas
10	Tarrant County Hospital District (JPS Health Network)	125	29	Fort Worth, Arlington
11	Palo Pinto General Hospital District	43	18	Abilene
12	Lubbock County Hospital District -University Medical Center	99	38	Amarillo, Lubbock
13	McCulloch County Hospital District	38	17	San Angelo
14	Ector County Hospital District (Medical Center Health System)	56	10	Odessa, Midland
15	University Medical Center of El Paso (El Paso Hospital District)	60	8	El Paso
16	Coryell County Memorial Hospital Authority	34	8	Waco
17	Texas A&M Health Science Center	28	11	College Station
18	Collin County	23	7	Plano
19	Electra Hospital District (Electra Memorial Hospital)	35	13	Wichita Falls
20	Webb County	24	8	Laredo

In December 2012, each RHP submitted a plan to HHSC that included a data-driven community needs assessment (CNA), a description of RHP stakeholder engagement, and a DSRIP project narrative, including valuation, for each four-year project proposed by a participating performing provider. All DSRIP projects were required to address one or more of the community needs identified in the RHP plan and had to be selected from the approved DSRIP project menu. The projects included in the RHP plans were reviewed and either approved, approved pending revisions, or denied by HHSC and CMS.

DSRIP Project Menu

Each DSRIP project included in the RHP plan had to include a description of the project selected from the approved DSRIP menu, outcome measures, and the community need(s) the project addressed. In the first round of plan submissions in 2012, the 20 RHPs submitted 1,322

four-year projects to CMS, virtually all projects (or a revised/replacement project) were approved, and 1,240 remained active as of June 2015. In 2014, RHPs were invited to submit proposals for additional three-year projects. Two hundred and thirty-two (232) three-year projects were submitted and approved, and there was funding for 218 to move forward. Two hundred and seventeen (217) were active as of June 2015. As of the end of 2016, there were a total of 1,451 four- and three-year active projects.

The DSRIP menu is comprised of the following four interrelated and complementary project categories (see Figure 1):

- Infrastructure development (Category 1 projects),
- Program innovation and redesign (Category 2 projects),
- Quality improvements (Category 3 outcomes), and
- Population focused improvements (Category 4 improvement measures).

Figure 1. DSRIP Project Descriptions

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┌─────────────────────────────────────────────────────────────────────────┐
│                        DSRIP Performing Providers                         │
└─────────────────────────────────────────────────────────────────────────┘

┌──────────────────────────────┐        ┌──────────────────────────────────┐
│      Project Categories       │        │        Project Outcomes           │
└──────────────────────────────┘        └──────────────────────────────────┘

┌──────────────────────────────┐        ┌──────────────────────────────────┐
│         Category 1:           │        │         Category 3:               │
│   Infrastructure Development  │        │      Quality Improvements         │
│                               │   ➜    │                                   │
│  Lays the foundation for      │        │  •  Health care delivery outcomes │
│  system transformation        │        │     and improvement targets tied  │
│  through investments in       │        │     to Category 1 and 2 projects  │
│  people, places, processes,   │        │  •  Outcomes selected from a      │
│  & technology                 │        │     predetermined menu, may be:   │
└──────────────────────────────┘        │                                   │
                                         │     o  Pay for performance        │
┌──────────────────────────────┐        │     o  Pay for reporting          │
│         Category 2:           │   ➜    │                                   │
│  Program Innovation & Redesign│        │                                   │
│                               │        │                                   │
│  Performing providers pilot   │        │                                   │
│  test and replicate innovative│        │                                   │
│  care models                  │        │                                   │
└──────────────────────────────┘        └──────────────────────────────────┘

┌─────────────────────────────────────────────────────────────────────────┐
│                           Health Care System                              │
└─────────────────────────────────────────────────────────────────────────┘

┌─────────────────────────────────────────────────────────────────────────┐
│                           Category 4:                                     │
│                  Population Focused Improvements                          │
│                                                                           │
│  Requires hospitals in all RHPs to report on the same measures:          │
│                                                                           │
│   •  Potentially preventable admissions                                   │
│   •  30-day readmissions                                                  │
│   •  Potentially preventable complications                                │
│   •  Patient-centered healthcare, including patient satisfaction and      │
│      medication management                                                │
│   •  Emergency department utilization                                     │
└─────────────────────────────────────────────────────────────────────────┘
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Category 1 - Infrastructure Development Projects

Category 1 projects lay the foundation for delivery system transformation through investments in people, places, processes, and technology. The most common Category 1 projects were those that expanded existing primary care capacity, improved access to specialty care, established more primary care clinics, and expanded the number of community-based settings for behavioral health services.

Category 2 - Program Innovation and Redesign Projects

Category 2 projects offer performing providers an opportunity to implement innovative care models as a method for system transformation. These projects often pilot existing evidenced-based models with new populations or replicate innovative care models implemented by other providers or in other locations. The most common Category 2 projects were those that implemented evidence-based interventions, targeted patients at high risk of disconnect, integrated primary and behavioral healthcare, and improved coordination of care for patients with chronic diseases.

Category 3 - Quality Improvement Outcomes

Categories 1 and 2 are the *types* of projects DSRIP performing providers designed and implemented to better reach and improve the health of specific populations. Providers must track and report quality outcomes (Category 3 measures) related the Category 1 or 2 project. Category 3 measures provide necessary information to demonstrate whether the Program is improving the healthcare delivery system in Texas. Performing providers report progress toward Category 3 metrics and milestones on a semi-annual basis. Payments are made based on their progress towards meeting the goals (pay-for-performance) or their reporting of measures as required (pay-for-reporting).

Category 3 measures are considered either stand-alone (SA) or non-stand-alone (NSA). This designation is tied to the type of outcome captured by the measure. Process measures are generally NSA measures whereas measures that describe clinical outcomes are considered SA measures. Each Category 1 or 2 project must have at least one SA measure or three NSA measures.

In order to examine the types of Category 3 measures used in the Program, they were grouped into thirteen types of measures (Table 2).

Table 2. Category 3 Measures

Type of Measures	Definition
Patient outcomes	Measures on a wide range of health, mental health, quality of life, and other patient outcomes (e.g., community support).
Screenings, assessments, and/or treatment/care plans	Measures the extent to which a screening or assessment was performed for health, mental health, or other outcomes (e.g., housing, independent living skills, vocational rehabilitation). This group also includes measures that relate to whether a treatment or care plan was developed. Several measures require both an assessment and a treatment plan.
Inpatient admissions, readmissions	Measures report on inpatient admission or readmission or unplanned re-operation within the same admission.
Emergency department (ED) utilization	Measures report on rates of ED utilization for ambulatory care sensitive conditions (e.g., hypertension, congestive heart failure, diabetes, asthma, etc.) or other medical conditions (e.g., behavioral health/substance abuse, end stage renal disease, etc.) in both adults and pediatric populations. It also includes measures on ED utilization for low acuity presenting patients.
Non-emergent service utilization	Measures report on the extent to which clients received specific types of non-emergency treatment or services.
Patient satisfaction	Measures report on patient's satisfaction with services, environment, and/or providers/staff.
Follow-up testing and treatment	Measures report on rates of follow-up after discharge for adult and pediatric populations following an in-patient hospitalization or diagnosis of a disorder that requires follow-up.
Provider communication, counseling, and cultural competence	Measures report on communications between providers and patients, other medical staff and patients, or providers/medical staff communicating with each other. This group includes measures of whether providers counseled patients on specific matters and measures of cultural competence.
Medication management and/or monitoring	Measures related to monitoring medication.
Availability of medical professionals	Pay-for-reporting measures that report on the amount of practitioners (primary care practitioners, nurse practitioners, psychiatrists, or other health professionals) who serve clients in medically underserved areas (MUAs) or a high number of Medicaid clients. This group also includes pay-for-reporting measures that serve or plan to serve clients in MUAs, health-professional shortage areas, or serve Medicaid clients.
Health-related behaviors	Measures report on the extent to which patients engage in specific behaviors, such as breastfeeding or using tobacco. This group only includes measures that *do not* otherwise fit under treatment/use of services. For example, having received a vaccination is categorized under treatment/use of services, not health-related behaviors.
Cost and/or cost savings	Measures: • Report the cost of illness, cost of care, or total cost index, or • Conduct a systematic analysis, cost utility analysis or cost benefit analysis of the effects and costs of alternative methods or programs for achieving a given objective and measures both benefits and costs in monetary units.
Medical home, continuity of care, & transition of care	Measures relate to the establishment of a medical home or usual source of care or of strengthening continuity of care. These also include measures related to transition of care communication.

Category 4 - Population Focused Improvements

Through Category 4, population-focused improvements, hospitals are required to report specific measures that reflect the health of the population. The goal of Category 4 is to build the capacity for reporting on a comprehensive set of population health metrics, so the emphasis is on

reporting of these measures, not improvement. The overall structure of the DSRIP program is such that improvements can be made to healthcare at both the individual patient and the delivery system levels. Categories 1 and 2 allow providers the flexibility to prioritize healthcare improvements to best meet the needs of their specific populations while Categories 3 and 4 provide a mechanism to monitor and measure these overall improvements to the healthcare delivery system in Texas. All RHPs are required to report on the same Category 4 reporting domains. Payments are based on their reporting of Category 4 measures as required.

DSRIP Projects Statewide

Table 3 displays the distribution of DSRIP projects by primary project type and RHP. Primary project type was selected by the performing provider to best describe the focus of their DSRIP project. They could select multiple secondary project types as appropriate to best represent their project.

Table 3. DSRIP Projects by Primary Type and Regional Healthcare Partnership (RHP)

DSRIP Projects by Primary Type and Regional Healthcare Partnership (RHP)																						
	RHP																				Total # of Projects	% of Projects
Primary Project Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Behavioral Health	22	28	54	19	20	33	36	20	28	27	9	19	11	8	9	15	5	15	10	10	398	27.4
Primary Care Expansion/Redesign	20	16	42	14	14	20	5	4	14	17	16	25	12	14	8	3	6	5	12	1	268	18.5
Patient Navigation/Care Coordination/Care Transitions	14	10	24	10	11	12	6	4	22	16	1	19	1	5	6	0	4	0	3	1	169	11.6
Chronic Care Management	5	6	17	11	8	9	9	2	18	22	6	8	5	8	6	6	4	1	0	1	152	10.5
Health Promotion/Disease Prevention	4	7	17	8	6	11	9	5	5	11	2	5	6	5	8	3	2	1	4	4	123	8.5
Process Improvement/Patient Experience	5	7	12	16	1	11	1	2	14	12	3	7	2	5	4	1	1	0	3	1	108	7.4
Specialty Care	12	5	0	7	9	13	3	1	9	10	4	5	0	6	9	2	3	0	2	4	104	7.2
Patient-Centered Medical Homes	4	1	3	2	4	3	1	1	7	4	1	3	0	0	2	1	1	1	0	1	40	2.8
Workforce Development	1	1	3	0	4	3	3	1	5	2	0	5	0	1	3	0	1	0	0	0	33	2.3
Palliative Care	2	1	2	0	0	3	1	0	2	3	1	3	1	2	1	3	1	0	1	0	27	1.9
Oral Health	2	0	3	1	1	4	1	0	4	1	0	0	0	0	1	0	0	0	0	1	19	1.3
Interpretation	0	1	0	0	0	2	1	0	1	0	0	0	0	2	3	0	0	0	0	0	10	0.7
TOTAL Number of Projects per RHP	91	83	177	88	78	124	76	40	129	125	43	99	38	56	60	34	28	23	35	24	1,451	100.0%
Percent (%) of total number of projects	6.3	5.7	12.2	6.1	5.4	8.5	5.2	2.8	8.9	8.6	3.0	6.8	2.6	3.9	4.1	2.3	1.9	1.6	2.4	1.7		

As of DY5 there were 1,451 active projects with behavioral health as the focus of 397 (27.4%), primary care expansion/redesign as the focus of 268 (8.5%), and patient navigation/care coordination/care transitions as the focus of 168 (11.6%) projects. RHP 3 had the most DSRIP projects with 177, while RHP 18 had the least with 23 DSRIP projects. This table displays the diversity of the DSRIP program in terms of priority needs and geographic distribution throughout the state.

To measure the incremental impact of the DSRIP program, performing providers reported the quantifiable patient impact (QPI) of each project and the proportion of Medicaid and low-income uninsured (MLIU) clients served. QPI is measured either in terms of unduplicated individuals served or encounters provided by project. QPI metrics count of individuals and encounters is above and beyond the baseline established in the pre-DSRIP period, i.e., services provided that occurred specifically due to DSRIP funding. Table 4 displays the total QPI of the DSRIP program reported each DY as of February 2017 and the reported proportion of MLIU clients served through DSRIP projects. Note that although individuals-based QPI is unduplicated at the project level, the aggregated figures in Table 4 are not unduplicated because it is possible that individuals are served by more than one DSRIP project.

As displayed in Table 4, the total number of individuals that performing providers aimed to serve above the pre-DSRIP level of service was 695,712; 1,312,925; and 2,340,710 in DY3, DY4, and DY5, respectively. Overall, these goals were surpassed as 1,265,310; 3,340,700; and 3,496,616 individuals were served in DY3, DY4, and DY5 to date, respectively. Over 96% of projects met their individual-level QPI goal in DY3 and DY4, while 77.1% of projects have met this goal in DY5 to date. Providers may continue to report achievement of DY5 QPI through October 31, 2017.

Additionally, the total number of encounters performing providers aimed to deliver was 1,173,595; 4,640,281; and 8,341,785 in DY3, DY4, and DY5, respectively. Overall, these goals were met in DY3 and DY4 as 2,278,626 and 6,486,209 encounters were delivered, respectively; and in DY5, 5,272,170 encounters have been delivered to date. Approximately 93%, 95%, and 71% of projects have met their encounter-level QPI goals for DY3, DY4, and DY5, respectively. Providers may continue to report achievement of DY5 QPI through October 31, 2017.

DSRIP performing providers aimed to serve a population made up of more than 60% MLIU individuals. Overall, these goals were met in DY3-DY5, serving a population made up of approximately 65% MLIU individuals.

Table 4. DSRIP Projects Statewide - Medicaid & Low-Income Uninsured Population & Quantifiable Patient Impact*

			DY3	DY4	DY5**
Number of active projects with QPI metrics			1,155	1,437	1,451
Number of active projects with individual-level QPI goal			727	891	895
Number of individual-level QPI metrics (Projects could have more than one QPI metric)			736	907	911
INDIVIDUALS	QPI Goal	Total number of individuals projects aimed to serve	695,712	1,312,925	2,340,710
		Median(range) number of individuals projects aimed to serve	198 (1 - 31,916)	300 (3 - 48,077)	400 (6 - 288,000)
	QPI Actual	Total number of individuals served through DSRIP projects	1,265,310	3,340,700	3,496,616
		Median(range) number of individuals projects served	252 (0 - 141,324)	418 (0 - 697,024)	460 (0 - 306,912)
	Number of individual-level QPI goals met (%)		721 (98.0%)	875 (96.5%)	702 (77.1%)
Number of active projects with encounter-level QPI goal			428	546	556
Number of encounter-level QPI metrics (Projects could have more than one QPI metric)			446	571	583
ENCOUNTERS	QPI Goal	Total number of encounters projects aimed to provide	1,173,595	4,640,281	8,341,785
		Median(range) number of encounters projects aimed to provide	698 (6 - 95,240)	1,380 (12 - 2,100,000)	2,156 (18 - 4,300,000)
	QPI Actual	Total number of encounters provided through DSRIP projects	2,278,626	6,486,209	5,272,170
		Median(range) number of encounters projects provided	1,235 (0 - 256,215)	2,285 (0 - 2,327,851)	2,921 (0 - 435,869)
	Number of encounter-level QPI goals met (%)		414 (92.8%)	540 (94.6%)	411 (70.5%)
MLIU POPULATION***	Goal: % MLIU (mean; minimum, maximum)		62.7% (4% - 100%)	61.1% (2% - 100%)	61.1% (2% - 100%)
	Actual: % MLIU (mean, range)		64.9% (0% - 100%)	64.8% (0% - 100%)	64.3% (0% - 100%)

*	Reported achievement as of February 28, 2017
**	DY5 data may be incomplete due to carry-forward requests
***	Medicaid & Low-Income Uninsured Individuals

Performing providers worked to improve selected Category 3 measures. While the types of Category 3 measures varied across projects, performing providers were paid based on their level of Category 3 measure achievement; that is, performing providers could receive partial payments if they did not fully meet their Category 3 outcomes goal and could also request that funds be carried-forward and earned in the next measurement period. To calculate the "percent earned" for Category 3 measures, the approved amount was divided by the project's value and multiplied by 100. A project's value is the maximum it can earn for a given DY, while the approved amount is based on reported achievement that was approved by HHSC. Providers

may be paid for achievement of DY4 measures until July 2017 and for achievement of DY5 measures until July 2018.

As displayed in Table 5, in DY2 performing providers consistently earned 100% of their projects' Category 3 value, with the exception of a small number of primary care expansion/redesign and process improvement/patient experience projects. In DY3, overall earnings were still very high, but there was a small number of projects that earned half of their valued amount. In DY4 and DY5, there is a much wider range in terms of what projects have earned to date. In no primary project type have the projects collectively earned 100% of their value. These figures are based on approved amounts as of October 2016. Performing providers may receive funds for DY4 achievement until July 2017 and for DY5 achievement until July 2018, so the percent-earned displayed here is likely to change.

Table 5. Category 3 Percent Earned (Amount Paid/ Project Value)

Primary Project Type	DY 2			DY 3			DY 4**			DY 5***		
	N	Mean %	Range %	N	Mean %	Range %	N	Mean %	Range %	N	Mean %	Range %
Behavioral Health	209	100 ± 0	100 - 100	397	99.5 ± 5.0	50 - 100	390	97.2 ± 9.7	50 - 100	348	87.5 ± 21.4	13 - 100
Primary Care Expansion/Redesign	223	99.7 ± 4.5	33.3 - 100	268	99.4 ± 5.5	50 - 100	263	90.4 ± 18.5	17 - 100	202	82.7 ± 27.1	8 - 100
Patient Navigation/Care Coordination/Care Transitions	132	100 ± 0	100 - 100	169	100 ± 0	100 - 100	165	91.7 ± 16.8	50 - 100	126	82.9 ± 27.4	13 - 100
Chronic Care Management	121	100 ± 0	100 - 100	152	99.7 ± 4.0	50 - 100	150	94.7 ± 14.8	25 - 100	117	87.1 ± 22.4	13 - 100
Health Promotion/Disease Prevention	70	100 ± 0	100 - 100	123	100 ± 0.3	97 - 100	121	95.6 ± 13.5	33 - 100	103	90.3 ± 19.8	17 - 100
Process Improvement/Patient Experience	101	99.5 ± 5.0	50 - 100	108	100 ± 0	100 - 100	108	93.8 ± 14.8	50 - 100	81	85.2 ± 25.5	25 - 100
Specialty Care	79	100 ± 0	100 - 100	104	98.3 ± 8.7	50 - 100	101	92.5 ± 16.2	46 - 100	79	88.1 ± 24.0	5 - 100
Patient-Centered Medical Homes	30	100 ± 0	100 - 100	40	100 ± 0	100 - 100	39	95.7 ± 13.6	50 - 100	33	90.3 ± 21.0	33 - 100
Workforce Development	20	100 ± 0	100 - 100	33	98.5 ± 8.7	50 - 100	33	93.8 ± 15.6	50 - 100	29	82.0 ± 24.9	8 - 100
Palliative Care	22	100 ± 0	100 - 100	27	100 ± 0	100 - 100	26	96.2 ± 13.6	50 - 100	23	94.9 ± 11.7	67 - 100
Oral Health	16	100 ± 0	100 - 100	19	100 ± 0	100 - 100	19	95.9 ± 12.5	50 - 100	17	96.1 ± 9.8	67 - 100
Interpretation	9	100 ± 0	100 - 100	10	100 ± 0	100 - 100	10	92.5 ± 16.9	50 - 100	9	76.4 ± 23.8	50 - 100

* Percent earned = [(amount approved based on Category 3 achievement reported) / (the value for Category 3 outcomes)] * 100

** DY4 Category 3 metrics must be reported as of September 30, 2016; Performing providers may earn Category 3 funds through July 2017

*** DY5 Category 3 metrics must be reported as of September 30, 2017; Performing providers may earn Category 3 funds through July 2018

Health Care Delivery Context

DSRIP's menu of projects possesses a unique flexibility capable of meeting the specific needs of communities. However, this flexibility presented a challenge in evaluating the impact of DSRIP statewide as it produced approximately 1,500 projects. The evaluation team's solution to this problem was to narrow DSRIP's assessment to a specific focus.

The ED has been described as a "room with a view," providing a look into the status of our health care system and population health (Asplin & Knopp, 2001; Kellermann & Martinez, 2011). A recent report published by the National Center for Health Statistics (Hing and Rui, 2016) profiled emergency department use in the five most populous states, including Texas. The rate of emergency department (ED) visits in Texas is 49 visits per 100 persons. The age distribution of ED visits in Texas is younger than the national average with 35% of ED visits attributed to children under 18 years, 53% to 18-64 year-olds, and 12% to adults 65 years and older, as compared to 21%, 63%, and 16%, respectively, at the national level. Ten percent of ED visits in Texas resulted in admission to the same hospital, as compared to 11% nationally, 16% in California, and 17% in Florida. The vast majority (80%) of ED visits in Texas occur in urban areas, but was lower when compared to 85% nationally, 98% in California, 97% in Florida, and 92% in New York. In Texas, Medicaid and CHIP are the expected primary payer for 30% of ED visits, as compared to 25% nationally and in CA, 16% in Florida, and 31% in New York; while 18% of ED visits in Texas, 14% nationally, 12% in California, 16% in Florida, and 11% in New York are among uninsured individuals.

While the ED should only address emergency health problems, many health conditions people go to the ED for are either non-emergent or preventable with proper disease management. The annual cost of potentially preventable visits to EDs in Texas alone has been estimated to exceed $1 billion (HHSC, 2012, p. 5). Preventable ED use is of such magnitude that the Texas Legislature instructed the Texas Health and Human Services Commission (HHSC) through H.B. 1, 82nd Legislature, Regular Session, 2011, to submit "steps to reduce non-emergent ED use in Medicaid" (HHSC, 2012, p. 3).

ED visits range from physical to mental health conditions (Chukmaitov et al., 2012; DiPietro et al. 2012; Johnson et al., 2012) and are disproportionately frequent among uninsured, low-income, and Medicaid beneficiaries (Johnson et al., 2012; Ondler et al., 2014). Studies have documented that a disproportionate share of ED visits are by patients who visit the ED two or more times in a given year (Hunt, Weber, & Showstack, 2006; Niska, Bhuiya, & Xu, 2010), which can be a symptom of improper ED utilization. DSRIP's expansion of primary care capacity, implementation of chronic disease management, and development of behavioral health care services have the potential to reduce preventable ED use.

With so much variety and diversity amongst DSRIP projects, evaluating all 1,500 projects as a whole was problematic. As a result, the evaluation conducted an extensive review of the DSRIP projects to identify a type of project occurring statewide that revealed meaningful information on DSRIP goals and complexities. Care Navigation (CN) was selected as the focus of the DSIRP evaluation due to its availability statewide, ability to address ED visits, and because it is "one of [Texas'] key strategies to reducing non-emergent ED use…" (HHSC, 2012, p. 5).

According to the Texas HHSC RHP Planning Protocol (2014, p. 242) patient navigation, or CN, is defined as ensuring "that patients receive coordinated, timely, and site-appropriate health care services. Navigators may assist in connecting patients to primary care physicians and/or medical home sites, as well as diverting non-emergent care from the ED to more appropriate locations." One factor affecting frequent ED use may be inadequate use of preventive care, which may be remedied with proper coordination and continuity of care for chronic conditions (Hoot & Aronsky, 2008; Johnson et al., 2012; Newton, Keirns, Cunningham, Hayward, & Stanley, 2008; Tang, Stein, Hsia, Maselli, & Gonzales, 2010; Chukmaitov et al., 2012; Tsai, et al., 2007). Patient care navigation (CN) is based on the theory that better coordination between patients and providers and among providers improves patients' use of preventive health care and thus reduces emergencies. The Texas Demonstration shift towards preventative care will improve health care quality, population health, and health care delivery cost-effectiveness.

Table 6. Key Terms and Definitions

Key Terms	Definitions
Average marginal effects	An average marginal effect estimates the population-averaged marginal difference in the probability of an outcome associated with a one unit change in a predictor. In the current study, that was often the difference associated with the presence, versus absence, of a binary independent variable.
CAHPS®	Consumer Assessment of Healthcare Providers and Systems Health Plan Survey
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services. Now known as Tricare (styled TRICARE), this is a health care program of the United States Department of Defense Military Health System.
Comorbidity index	This is an additive index created by Sangha et al. (2003) to indicate overall patient health severity, and is calculated as the sum of patient responses to questions about the presence of 13 health conditions, whether they are receiving treatment for each, and whether each is affecting their functioning.
CN	Care navigation (CN) services are intended to ensure "that patients receive coordinated, timely, and site-appropriate health care services. Navigators may assist in connecting patients to primary care physicians and/or medical home sites, as well as diverting nonurgent care from the Emergency Department to site-appropriate locations." Texas Health and Human Services Commission RHP Planning Protocol (2014, p. 242)
Consolidated framework for implementation research	This framework draws on prior implementation research to identify a range of factors previously found to affect implementation outcomes (Damschroder et al., 2009)
Demonstration	Texas Healthcare Transformation and Quality Improvement Program
DSRIP	Delivery System Reform Incentive Payment (DSRIP) pool. Under the Demonstration, an incentive payment pool for hospitals and other providers to transform their service delivery practices to improve quality, health status, patient experience, coordination, and cost-effectiveness.
DSH	Disproportionate share hospital (DSH) payments are federal supplemental payments made to qualifying hospitals that serve a large number of Medicaid and uninsured patients, to partially offset UC costs
ECHO™	The Experience of Care and Health Outcomes survey. The ECHO™ survey is the CAHPS® survey of behavioral health services provided by managed care plans and managed behavioral health organizations.
ED	Emergency department, within a hospital
Fixed effects	Fixed effects are binary indictors (i.e., = 0 or 1) that can be used to control for attributes of context, such as site, that might otherwise bias the estimate of the key independent variables within multiple regressions.
FTE	Any combination of staffing adding to 40 hours/week is counted as a full time equivalent (FTE).
Health professional shortage area	Any of the following the federal government has determined to have a shortage of health professional(s): (1) An urban or rural area (which need not conform to the geographic boundaries of a political subdivision and which is a rational area for the delivery of health services); (2) a population group; or (3) a public or nonprofit private medical facility. http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/designationcriteria.html

Key Terms	Definitions
Huber-White sandwich estimator	The Huber-White sandwich estimator (Freedman, 2006) is a post-hoc adjustment to standard errors to ensure robustness to potential heteroscedasticity and within-site correlations among observations (De Leeuw & Meijer, 2008).
Random effects	Random effects are a statistical option within regression models that allows prediction of variation within and across sites.
RHP	Regional healthcare partnerships (RHP) are locally-developed confederations. Counties and other governmental entities providing state share determine how their funds are used in the regional healthcare partnership consistent with waiver requirements (Texas Health and Human Services Commission, 2016).
RUCC	Rural-urban continuum codes (RUCC) are developed by the US Department of Agriculture to categorize counties based on population density and proximity to metropolitan areas.
SF-8™	The Short Form-8 is an abbreviated version of the most common patient survey used in the US to gauge physical and mental health-related functioning.
STC	Special terms and conditions (STC) are the terms specifying the Demonstration evaluation the Centers for Medicare and Medicaid Services (CMS) is requiring Texas to submit.
THCIC	The Texas Health Care Information Collection is legislatively mandated collection and reporting of data on health care activity in hospitals and health maintenance organizations operating in Texas (https://www.dshs.texas.gov/thcic/).
Tier	Texas Health and Human Services Commission designated each of the 20 RHPs across the state into one of four categories determined by a formula that accounted for the proportion of the State's population in that RHP below 200 percent of the federal poverty level and presence of public hospitals.
Truven	Truven Health is the firm that provided the data on ED costs the evaluation team used to estimate the average cost of such a visit for patients participating in the phone survey.
UC	The total of Medicaid shortfall, uninsured shortfall, and unreimbursed costs related to hospital-affiliated physician, clinic, and pharmacy services.

EVALUATION GOALS

The special terms and conditions (STC) for this evaluation included determining whether the RHPs have shown quantifiable improvement on measures related to the "Triple Aim"- improving the experience of care/quality, and population health, while containing healthcare costs - and the degree to which such improvements can be attributed to DSRIP activities (Berwick, Nolan, & Whittington, 2008). The evaluation goals for DSRIP are:

Evaluation Goal 6: Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted the **quality** of care.

Evaluation Goal 7*:* Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted **health** of the population served.

Evaluation Goal 8: Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted the **costs** of providing that care.

EVALUATION DESIGN

Over 1,500 DSRIP projects launched throughout Texas, which created problems in evaluating DSRIP since the massive scale of Texas DSRIP minimized the feasibility of wide-scale comparison groups. A comparative case study methodology was selected to conduct the

evaluation based on the absence of experimental control, the ability to trace change as it occurred, and the diverse range of data collection possibilities (Yin, 2014).

The complexity of DSRIP projects made it necessary to "follow each case in considerable detail," and thus to have a "relatively small" sample (Real & Poole, 2005, p. 88). Through a comparative case study design, could focus on select CN sites throughout the state of Texas, and collect extensive data to better understand the nature of DSRIP.

SAMPLE AND UNITS OF ANALYSIS

The primary sampling unit was the DSRIP project and the evaluation selected 10 DSRIP projects statewide, including a mix of rural and urban service areas, to encompass potential differences in population needs, provider supply, and local infrastructure (e.g., transportation) (Miles et al., 2014).

Although CN was found across the state, it was not present in all RHPs (no project was). The evaluation team created 10 research areas of the state that did contain CN sites; the 10 research sites overlap with the established RHPs with a few alterations (Figure 2).
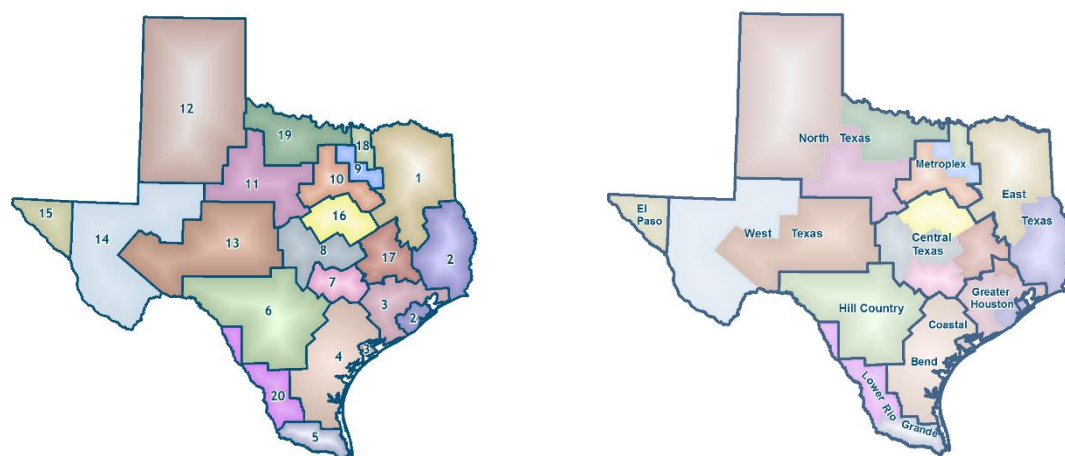
Figure 2. From 20 Regional Health Partnerships to 10 Case Study Sampling Areas

Within CN, the evaluation team identified the largest set of projects as those focused on reducing emergency department (ED) use through care navigation. The evaluation team then identified additional DSRIP projects that shared a significant focus on CN and reducing ED use, even if they were assigned other project option numbers by their developers. A final list was developed of 55 DSRIP projects that sought to reduce ED use through CN. From these 55 projects, the final 10 were chosen to include some with rural primary service areas, including one identified as an "extreme" case of rurality; some with urban primary service areas, including two in Texas' largest cities; and adequate representation of the types of providers statewide who had proposed this type of project and of the local population demographics. Table 7 profiles the projects chosen for the case study sample compared to all DSRIP projects eligible for inclusion.

Descriptive statistics also indicate that the 10 projects chosen for in-depth examination were representative of all DSRIP ED-related CN projects in a number of key attributes.

Table 7. Case Study Projects at Time of Selection Versus All DSRIP Emergency Department Reduction Care Navigation Projects

	Case study site (mean or %)	All eligible DSRIP ED CN projects (mean or %)
Based in a public provider	70%	47%
Based in a private provider	20%	45%
Provider ownership unknown	10%	7%
Hospital-based	80%	82%
A priori valuation in initial project plan	$5.1 million	$6.1 million
Urban (RUCC = 1 or 2)	40%	61%
Suburban (RUCC between 3 and 7)	30%	31%
Rural (RUCC = 8 or 9) (over-sampled by design)	30%	8%
% county < Federal Poverty Level	20%	17%
% county Hispanic	47%	30%
% county Black	9%	13%
Population of primary county served	Approx. 950,000	Approx. 1,050,000
Number of persons in Medicaid in county	Approx. 150,000	Approx. 140,000

CN indicates care navigation; DSRIP, Delivery System Reform Incentive Pool; ED, emergency department; RUCC, Rural-Urban Continuum
Rural-urban continuum codes (RUCC), 2013
http://www.ers.usda.gov/data-products/rural-urban-continuum-codes/.aspx

To compare changes in quality, health, and cost outcomes over time between sites with and without DSRIP care navigation projects, this study compared each DSRIP care navigation facility to a comparison site with similar population needs, provider supply, and local infrastructure in the same study region. The choice of these comparison EDs was also validated as comparable to the DSRIP EDs through discussions with three former Texas hospital Chief Executive Officers (CEOs).

A site was removed from the sample and replaced with another DSRIP CN project for subsequent analyses when the site was unable to implement their CN project. Between initial site visits and second site visits, a second DSRIP CN site closed. A comparison site started a DSRIP CN project, so that facility was moved from the comparison group to the DSRIP CN group for subsequent analyses. Hence, between the beginning and end of this evaluation, the total sample ranged from 21 to 19 sites (with 10 DSRIP-funded sites and 9 comparison sites remaining in 2016).

CONCEPTUAL FRAMEWORK AND MEASURES

In linking numerous comprehensive healthcare services with patients, CN projects may be constructively examined as complex process innovations (Scott, 1990). These innovations are embedded within providers' relationships with other local health and human services providers as well as with patients. A currently prominent framework to examine complex health care process innovations is the Consolidated Framework for Implementation Research (Damschroder et al., 2009; Smith et al., 2014). This framework draws on extensive prior research clarifying how local contexts may affect implementation processes, as well as categorizing innovation processes that may affect their intended outcomes (Figure 3).
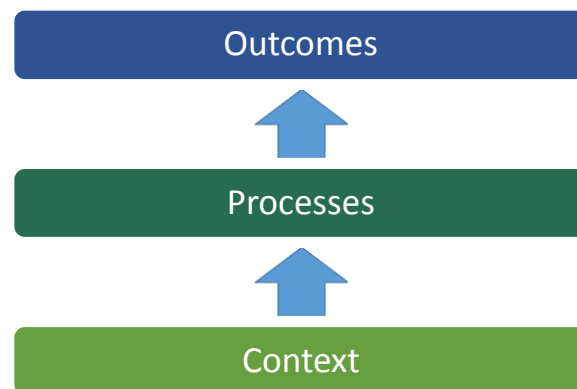
Figure 3. How Innovations Affect Outcomes (Adapted from Damschroder et al., 2009; Klein & Sorra, 1996)

Context

Consistent with other systematic reviews (Fixsen, et al, 2005; Greenhalgh, et al., 2005), Damschroder et al. (2009) found that a range of organizational and local factors affected implementation effectiveness. For example, previous research has identified lack of role clarity as a significant barrier to health care professionals' delivery and coordination of patient care (Hemsley & Balandin, 2014; Nosbusch, Weiss, & Bobay, 2010; Roch, Dubois, & Clark, 2014; and Wheeler et al., 2009). Facilitative programs such as CN also depend on the services to which they refer.

Processes

Prior research on CN and related coordination services has tended to test their overall impact on outcomes without disaggregating to clarify which elements yielded those outcomes (e.g., Enard, 2013; Harper, 2013; Gary, 2009). For instance, CN that includes follow-up calls to patients has been associated with more patient satisfaction with information clarity and preparation for transitions in care, more follow-up by patients on community referrals, and enhanced well-being (McCusker, 2003). Prior research has shown that better client-professional coordination improves client outcomes (Martin et al., 2000). This positive sequence may begin

by including patients as partners in planning their own services (Jolles & Wells, 2016). In turn, such cooperation between patients and care navigators, as well as such logistical support as transportation (Arcury et al., 2005), may make referrals to needed preventive services more effective (Okin, 2000). Research has demonstrated that comprehensive services with multiple and detailed processes have more impact than interventions of more limited scope (Durlak & DuPre, 2008).

Outcomes

Overall DSRIP Quantifiable Patient Impact

To measure the incremental impact of the DSRIP program, performing providers reported the quantifiable patient impact (QPI) of each project and the proportion of Medicaid and low-income uninsured (MLIU) clients served. QPI is measured either in terms of unduplicated individuals served or encounters provided by project.

QPI measures capture individuals served and encounters provided above the baseline established in the pre-DSRIP period, i.e., services provided that occurred specifically due to DSRIP funding. QPI provides a manner though which to measure the incremental impact of the DSRIP program.

CN DSRIP Projects

Table 8 lists the measures used within this evaluation for each key outcome within the evaluation's Triple Aim scope: health care quality, population health, and costs.

Table 8. Outcome Measures Used as Dependent Variables Reflecting Health Care Quality, Population Health, and Costs.

Outcome	Performance indicator	Data source	Period	Sample size
Quality	**Patient understanding of health care options:** Three Experience of Care and Health Outcomes (ECHO™) items: At this point do you: (1) Have information about different kinds of education or treatment that are available? (2) Have information about your rights as a patient? (3) Feel you could refuse a specific type of medication, test, or treatment? **Access to preventive care**: Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Health Plan Survey Medicaid module questions: At this point: (1) How often is it easy to get the care, tests, or treatment you think you need? (2) How often is it easy for you to get appointments with specialists? (3) When you need care right away for an illness, injury, or condition, how often do you get care as soon as you need it? (4) Not counting the times you needed care right away, how often did you get an appointment as soon as you thought you needed? **Coordination among providers:** Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Health Plan Survey items: At this point: (1) How often is it easy to get providers to agree with each other on the best way to manage your health condition? (2) Is your personal doctor usually or always informed and up-to-date about the care you received from other doctors or health providers?	Phone survey of patients	DY5	437 patients from 13 sites
Health	**Self-reported health and functioning:** Patient responses to the Optum SF-8™ health survey. Using Optum's algorithms, the eight items yield scales for physical and mental health, respectively. The SF-8™ is well-suited for measuring population health outcomes (Ware, Kosinski, Dewey, & Gandek, 2001).			
Costs	**Cost of patients' individual ED use**: Using self-reports from the patient phone survey, the evaluation team assigned each patient's potential future ED visit to an estimated level of resource intensity, based on the patient's comorbidities and treatment status from the self-administered comorbidity questionnaire (Sangha et al., 2003). Using 2014 Truven Health MarketScan data, the evaluation team then assigned an ED visit cost to each patient's likely future ED visit for each study site's 3 digit zip code prefix based on the mean payments for each level of ED visit. Statewide means derived from discharge (THCIC) data were used to adjust cost for each patient up or down based on the patient's self-reported health insurance status. Finally, the costs were adjusted up to 2016 dollars based on medical inflation between 2014 and 2016. **Hospital Use: Hospital encounters and length of stay.** Using hospital discharge data from THCIC. In the regression, hospital encounters were dichotomized to a 1/0 measure of any encounters in the first year after beginning CN. Length of stay is measured in days, and was log-transformed for the regression model.	Phone survey of patients + Truven Health MarketScan database outpatient file + Texas Health Care Information Collection (THCIC)		4,249 patients from 4 sites

Note: Medicaid claims data are not well suited to estimate the costs of ED visits because these data understate the total cost to the state due to adjustments as DSH and UC adjustments.

Figure 4 adapts the consolidated framework for implementation research to DSRIP CN implementation processes that may affect projects' health care quality, population health, and costs (Damschroder et al. 2009; Klein & Sorra, 1996).

Wagner's Chronic Care model emphasizes facets of the local context such as community resources, as well as organizational factors such as leadership support, decision support, and clinical information systems (Wagner et al., 1999; Coleman et al., 2009). Second, the intent of DSRIP CN was to improve health care quality, population health, and costs relative to usual care. Coleman's care transitions model includes four dimensions of patient disease self-management, and specifies levels of interactions with care navigators intended to support patients in developing control over their own health care (Coleman et al., 2006). Both process and contextual attributes were examined to see which factors were associated with outcomes.

Figure 4. How DSRIP Care Navigation Contexts May Affect Processes and Outcomes
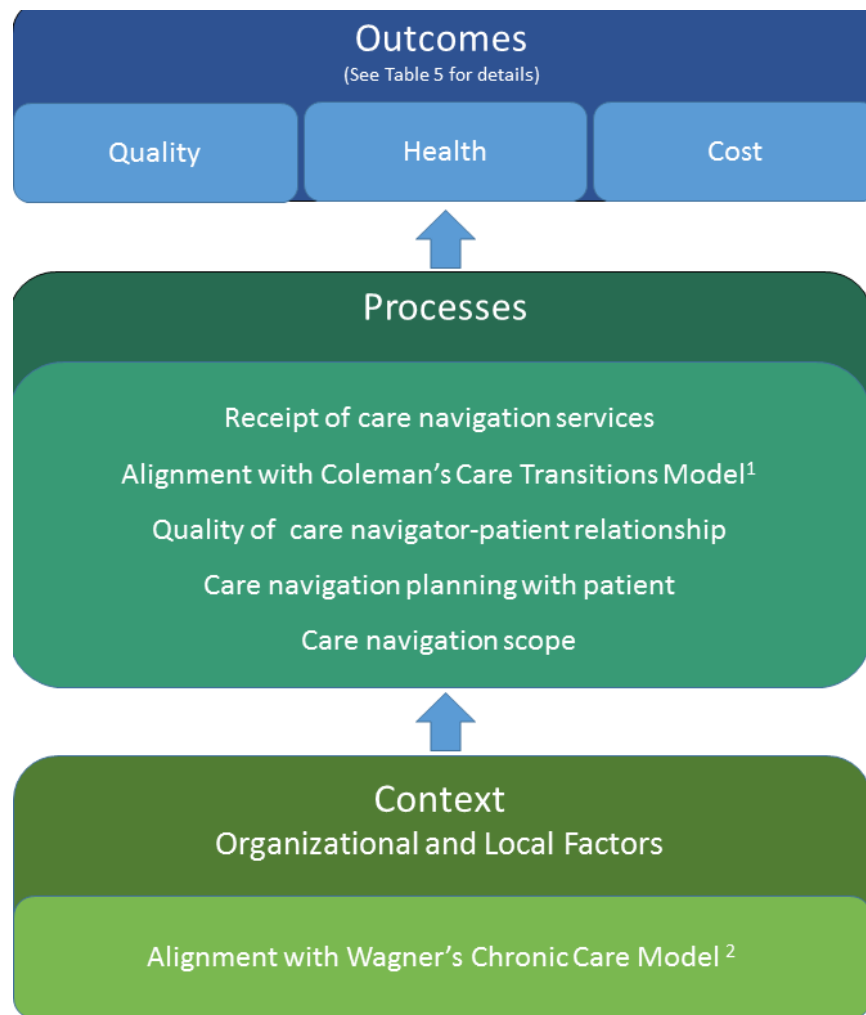
[1]Coleman's Care Transitions Model is a patient-centered intervention to facilitate the transition of patients from the hospital to the home (Coleman et al., 2006).
[2]Wagner's Chronic Care Model is a system resources approach to improving care. (Wagner et al., 1999;

DATA COLLECTION

The first round of DSRIP projects began implementation in demonstration year 3 (DY3; third year of DSRIP implementation), which started on October 1, 2013. Therefore, data collection for Evaluation Goals 6-8 began in DY3, as sites began project implementation. Primary data were obtained in three waves of interviews, largely during site visits or by phone with key informants, front line staff, patients, and key partners (i.e. representatives of units and agencies to which care navigators referred patients, such as rural health clinics, other primary care providers, mental health providers, and home health care) (See Figure 5).

Figure 5. Data Collection Timeline for Evaluation Plan

Initial site visits were conducted at 10 DSRIP CN sites and 10 comparison sites that had no DSRIP CN project. Initial site visits to DSRIP CN sites were conducted as close as feasible to one month after they became operational. During all initial site visits to both DSRIP CN and comparison sites, the evaluation team conducted focused interviews with key informants; at DSRIP CN sites, they also interviewed front line staff and patients identified as having received CN services, and surveyed key partners identified by care navigators at each site.

A year later, telephone interviews were conducted with key informants at all sites, to keep apprised of project developments in DSRIP CN sites and self-reports of ED use at comparison sites.

Two years after initial site visits, primary data were again collected from all sites. The evaluation team conducted a second site visit to DSRIP CN projects to interview key informants and front

line staff, and conducted telephone interviews with key informants at comparison sites, focusing on verifying information from prior interviews as well as eliciting any changes in the intervening year that might have affected ED use. Whenever possible, the evaluation team re-interviewed the individuals who had participated in previous interviews, including additional staff members at the discretion of the key informant. During the second site visit to DSRIP CN sites, the evaluation team also conducted focus groups with patients who had recently received CN services, and after those visits, for a second time surveyed key partners identified by care navigators at each site.

The telephone survey instrument for interviewing patients was pilot-tested extensively during DY3 and DY4; the survey was then conducted during February and March 2016 (DY5) with patients from DSRIP CN sites as well as comparison sites.

The patient phone survey was extensively pilot-tested, first with two English-speaking and two Spanish-speaking patients, to streamline wording. It was then tested with two small samples of patients. Feedback from members of the evaluation team and the survey calling staff was used to revise the survey for more logical flow and to expand scripting for survey staff to enhance patient understanding and comfort. Pilot-testing of the survey instrument was completed with additional patients from DSRIP CN sites and comparison sites during DY3 and DY4. Analyses of those pilot group data and more feedback from survey callers informed revisions of the instrument for surveying patients in DY5. For example, an extremely low percentage of patients in the pilot group acknowledged substance use, and a comparison of patients' self-reported health conditions with their self-reported medications indicated that questions about medications had not yielded additional information about health conditions; therefore items on both substance use and medications were eliminated from the survey. Factor analyses of scales in the pilot group data confirmed high within-scale reliability, so no additional changes to the survey were needed on that basis.

During site visits, the evaluation team recorded observations and diagramed the facilities' organization and work flow (see Figures 6 - 8). The evaluation team ensured sampling diversity for professionals by interviewing individuals representing a range of roles at each site, from DSRIP projects' initial developers, to current project leadership, to care navigators, and other front line staff. To understand how projects originated and were adapted over time, the evaluation team also used the HHSC-approved initial DSRIP project plans to indicate original intent; project updates to HHSC to identify key changes in project evolution since inception, and any reports available from the Myers and Stauffer mid-point assessment (2015) and clinical champions about projects in the study sample.

Key Informants

Key informants were individuals with overall knowledge of each site. At DSRIP CN sites, key informants generally oversaw DSRIP projects. At comparison sites, key informants were knowledgeable about patterns of frequent ED use at their facilities. Interviews of key informants at DSRIP CN sites provided contextual information about why the site initiated that project, and how the project related to other factors affecting ED use. The administrator of one DSRIP CN project that had been approved by HHSC was not able to implement this project, but provided

perspective through a phone interview on why the facility was unable to become operational. That site was then removed from the sample, and replaced with another DSRIP CN project for subsequent analyses. Between initial site visits and second site visits, a second DSRIP CN site closed; in addition, a comparison site started a DSRIP CN project, so that facility was moved from the comparison group to the DSRIP CN group for subsequent analyses. Hence, between the beginning and end of this evaluation, the total sample ranged from 21 to 19 sites (with 10 DSRIP-funded sites and 9 comparison sites remaining in 2016).

At each site, the researchers invited the contact who set up the interview schedule (and who typically also served as the key informant) to include any other front line staff who were integral to patient CN. This respondent-driven sample resulted in including ED directors, chief nursing officers, and administrators with responsibility for quality improvement.

Care Navigators and Other Front Line Staff

At DSRIP CN sites, the evaluation team interviewed care navigators about their relevant skills and organizational support for CN. During each site visit, CN staff were asked to describe, without identification, a small sample of patients for whom they had provided CN. During the second site visit, care navigators were asked to describe: a "typical" patient, a patient who benefited the most from CN, and another who had benefited the least from these services.

A key component of CN is connecting patients to needed health and human services. The evaluation team therefore asked the care navigators to identify internal or external agency key partners upon which they relied to meet patient needs. Key partners could either be other units within the lead organization (e.g., a disease management project) or external agencies (e.g., the local health department or a homeless shelter). In order to ensure reliable identification across sites of "key" partners, the evaluation team asked care navigators to nominate those with which they interacted at least once a month (Wells et al., 2004). In interviews during the second site visit, the evaluation team noted the key partners identified during the initial site visit and asked if the CN project still interacted with each at least once a month, as well as what new partners they might have. Each time, the interviewers asked the care navigator to characterize interactions using the relational coordination scale. This scale was developed to measure the quality of interactions within interdisciplinary teams and between professionals and patients (Gittell, 2004).

In second site visits care navigators at each site were also asked to use the relational coordination scale to characterize interactions with a (deidentified) patient they had considered "typical." Care navigators were also asked the same set of questions about patients they considered most and least benefited, although those results are not shown.

Key Partners

After initial and second site visits, key partners identified by care navigators were surveyed about their experiences working with care navigators, using the same set of relational coordination questions the evaluation team had asked the care navigators about the key partners.

Patients and Patient Family Members

Primary data about patient experiences were obtained from patients at ED CN sites in individual interviews during first site visits and focus groups during second site visits, as well as with patients at CN and comparison sites through the telephone survey conducted during DY5.

The patient phone survey was extensively pilot-tested, first with two English-speaking and two Spanish-speaking patients, to streamline wording. It was then tested with two small samples of patients. Feedback from members of the evaluation team and the survey calling staff was used to revise the survey for more logical flow and to expand scripting for survey staff to enhance patient understanding and comfort. Pilot-testing of the survey instrument was completed with additional patients from DSRIP CN sites and comparison sites during DY3 and DY4. Analyses of those pilot group data and more feedback from survey callers informed revisions of the instrument for surveying patients in DY5. For example, an extremely low percentage of patients in the pilot group acknowledged substance use, and a comparison of patients' self-reported health conditions with their self-reported medications indicated that questions about medications had not yielded additional information about health conditions; therefore items on both substance use and medications were eliminated from the survey. Factor analyses of scales in the pilot group data confirmed high within-scale reliability, so no additional changes to the survey were needed on that basis.

To make comparative analyses possible between patients at DSRIP CN sites and comparison sites, in DY5 the telephone survey was conducted with patients at both types of sites. Fifteen providers across Texas provided rosters of 1,441 patients to approach for the survey; these included all ten sites with DSRIP-funded care coordination and the five concurrent comparison sites that were able to provide rosters. The sites with DSRIP care coordination projects provided contact information for all patients who had received at least one DSRIP care coordination encounter in the most recent two months before surveying began (December 2015 or January 2016). The DSRIP CN sites provided CN services to patients who had been frequent ED users (five or more ED visits in the previous year), or who were considered to be at great risk for frequently using the ED. The comparison sites identified patients with frequent ED visits over the prior year (defined by four hospitals as five or more visits and defined by one small hospital as three or more visits), some of whom may have received medication management or patient navigation under non-waiver-funded hospital initiatives. In total, the DSRIP care coordination sites provided usable contact information for 490 patients and the comparison sites provided contact information for 951 patients. A total of 437 patients (30%) across 13 sites participated in the phone survey: 168 patients from 9 of the 10 DSRIP CN sites and 269 patients from 4 of the 5 comparison sites that had provided rosters. It was not necessary to procure rosters from all comparison sites to yield a sufficient comparison sample, because the comparison sample was already larger than the DSRIP CN sample. One common reason for not participating was disconnected or incorrect phone numbers. The two sites with no participants were rural and had small patient rosters with fewer than 10 patients.

QUANTITATIVE ANALYSIS

Each outcome in Table 7 (i.e., quality, health, and cost) was examined for an association with key independent variables, while controlling for covariates. A basic regression model is provided as an example:

$$\text{Outcome}_{ij} = \beta_0 + \beta_1 \textbf{Key Independent variable(s)}_j + \beta_{2\text{-}11}\text{Covariates}_{ijt} + \varepsilon_{ij}$$

Where the statistical unit of analysis was patient$_i$ in facility$_j$. These were conducted as cross-sectional models. Therefore, associations between key independent variables and each outcome were the goal of the statistical tests, thus causality cannot be determined. The total sample size was 437 patients, with 168 of those participants in DSRIP CN sites. The final sample size for each model reflected the number of observations with data for all variables. For example, models assessing the outcomes of specific facets of care navigation included only patients who reported receiving care navigation, and hence could describe those attributes.

Although each DSRIP CN site was matched to a non DSRIP CN site, very small sample sizes at some sites made this approach infeasible in analyses. Hence, the evaluation team instead included three separate binary variables, adjusting for whether each DSRIP CN project was based in a Community Mental Health Center (CMHC), or emergency medical service (EMS), with the referent group being projects based directly within a hospital.

The Huber-White Sandwich Estimator (Freedman, 2006) was used as a post-hoc adjustment to standard errors to ensure robustness to potential heteroscedasticity and within-site correlations among observations (De Leeuw & Meijer, 2008). Intraclass correlation coefficients were low, ranging from 0% to 5%. Random effects are not appropriate for such a small number of clusters (sites), because the assumptions upon which these models are based are likely to be violated, which would lead to biased coefficients (Raudenbush & Bryk, 2002). Fixed effects are also not appropriate for these models, because the focal coefficient is at the site level (DSRIP CN). Key independent variables were tested through both individual coefficients and joint F-tests and sets of independent variables when there was more than one predictor. Joint F-tests are not shown for any models with a single key independent variable, because in those models the coefficient for that independent variable already indicates whether its association with each dependent variable was statistically significant.

Effect sizes for statistically significant individual coefficients are explained below through average marginal effects. These differences in probabilities were estimated using the margins command in Stata SE14 (StataCorp: College Station, TX, 2015).

Power analyses were conducted in Stata, and then adjusted these estimates based on eta-square statistics indicating the degree of correlation of each dependent variable within site. Because the sample size was already set, a theorized effect size of 10% was used to determine whether there was at least an 80% chance of detecting any true effect of CN on these outcomes. Given the paucity of prior relevant empirical research to serve as a basis for the effect size, the 10% chosen reflects the smallest size that we believed would be substantively meaningful across outcomes.

MULTIVARIABLE ANALYSES

Regression models included one or more key independent variables, as well as an additional set of covariates to reduce confounding of the focal effects. In all analyses, the comorbidity index used as a covariate was developed by Sangha, et al. (2003) for measuring patients' disease burden. Some additional variables were tested and eliminated in preliminary analyses because they did not affect key coefficients. Those variables were indicators of patient sex, dual Medicare-Medicaid eligibility, and an "other" category for health insurance that likely sometimes reflected site-specific payment support plans, but did not affect focal coefficients. In addition, although three rural sites shared patient rosters for the phone survey, the rosters tended to include very few names. As a result, only seven rural patients participated in the survey, all from one DSRIP CN site. Hence, the models do not control for rurality.

Logistic regression results are shown as coefficients rather than odds ratios. The reason for showing coefficients rather than odds ratios for the logistic regressions is to make it easier to read results in tables that also include ordinary least squares, because negative versus positive coefficients have the same meaning for both types of models.

Effect sizes for statistically significant individual coefficients are explained through average marginal effects. By translating the coefficient into an average marginal effect, probabilities are produced. An average marginal effect estimates the population-averaged marginal difference in the probability of an outcome associated with a one unit change in a predictor. Although they are based on the values shown in tables, these percentage point differences are not themselves shown within the respective tables.

QUALITATIVE ANALYSES

Qualitative data were used to contextualize and interpret quantitative analyses. Using ATLAS.ti software 7.5.12. (Berlin, Scientific Sofware Development GmBH, 2015) the evaluation team coded data from project documentation, site visit interviews, and observations, using initial codes based on the consolidated framework for implementation research (Damschroder et al., 2009; Miles et al., 2014). The evaluation team met throughout the spring of 2015 to review and refine codes to ensure fit with the current evaluation data as well as their reliable application by multiple coders. For example, the coding team clarified that CN social support included patients feeling personally cared for, and added a code for project sustainability as its salience emerged. The evaluation team then applied these revised codes to all subsequent data, again meeting weekly to discuss coding decisions and resulting insights about CN project dynamics and outcomes (Miles et al., 2014).

RESULTS

CONTEXT

Defining DSRIP Care Navigation

The essence of CN was facilitating patients' use of the resources they needed to improve their health.

> Care navigator at site L: You have multiple layers of barriers… in order to be able to get the services that they need. That can be based on policy constraints, prior authorization, referral processes, documentation and then financial. Part of our job is to help them navigate through that system.

Care navigators had to learn how to manage these challenging patients within their limited time and resources:

> Care navigator at site C: Over time, you tend to know where to direct the patients. They see you, they're, "Can you get me my insurance? Can you get me these things?" We're, "Okay. This is where we fit in. We can help direct you to where to get those."

Key informant at Site L described expending significant initial effort into: "…looking at what constitutes navigation support. Constantly redefining and reassessing what services." However, although DSRIP projects continued to experiment with process improvements over time, the changes appeared to become more incremental as the projects matured. The same key informant observed, "... now, it remains at a handful of things that our staff supports whether it's funding, some clinical, minor clinical services, really focusing on the removal of barriers." No differences were identified between patient accounts of their care navigation experiences across waves.

Although DSRIP CN varied both across sites and according to individual patient needs, there were some commonalities:

- Active patient identification and enrollment into DSRIP CN
- Patient education
- Referrals to other services
- Follow-up

Patient Identification and Care Navigators

In hospital-based projects, patients were identified through referrals from the ED as well as from external facilities. External referrals came from rural health clinics, FQHCs and urgent care facilities. In EMS-based navigation projects, patients were identified via 911 calls and then contacted by project staff for care navigation. Standard practice at all DSRIP CN sites included contact with identified patients at least once by phone or in person.

All 10 project sites had designated staff titled "care navigators" "care coordinators" or "coaches" to engage with patients who were identified as frequent visitors of the ED. Care navigators at 7 out of 10 sites developed written care plans for patients.

> Care navigator at site C: We do a full psychosocial assessment… to figure out exactly what's going on, what led you to this point, what services are you lacking, whether that be in the community—from a social work perspective, if there's any transportation, assistance with housing, or any food or mental health resources, connecting them with primary care physicians, whatever that is, or even linking them to our nurse who does the patient education.

Patient Education

Care navigators often educated patients and their families on chronic disease management, including medication use; nutrition; and smoking cessation to help them self-manage their illnesses and improve overall health. This often included giving patients written materials on chronic diseases such as diabetes and hypertension, as well as sometimes extending to many conversations over time. About two-thirds of the patients receiving DSRIP CN who were surveyed by phone said that they received information about managing their health conditions.

> Care navigator at site M: We even teach them to write down questions for the doctor because I tell them, "You're going to a doctor." Doctor comes in, and they're like, "We forget." Okay? We write down all the questions for the doctors, and then, my first thing is you need to ask for refills on all your meds. Okay? If they don't have money, you can call me. We can help you. Because I don't want you to be without meds. Especially if they have high blood pressure, I tell them, "Every time we have a patient with a stroke, guess what, because they ran out of medications. It happens every day. . . . I don't want that for you." . . . We do a lot of teaching

Problem solving and coaching often went beyond health care to other needs, such as financial planning and housing.

> Care navigator at site C: She has very little SNAP benefits so . . . we talked about couponing.

Care Navigators educated patients, families, and even providers because they recognized health changes required collaboration between different people.

> Care navigator at site I: I usually tell them when they first come we like for other family members to listen to this because you have to make changes with your diet …

Care navigators also provided assistance, particularly with forms and applications, like Social Security disability benefits, Medicaid and Medicare, charity care, food stamps, and other financial assistance programs.

Care navigator at site L: I explained that, if he comes to the office, I'd be glad to do the application, making sure that he gets food stamps, then I can make contacts and call and try to expedite a [financial assistance program] appointment.

Patient at site C:. . .without my birth certificate I can't [get a] Social Security card, can't get Social Security without the birth certificate. I'm going in circles, what do I do? They helped me get a voter registration. . . . Then I was able to get my ID, then I was able to get the Social Security card.

Patient at site N: Well, in a couple of their trips that they came to the house was for [local transportation service]. They went downtown and got the application for me, brought it to me. I filled it out. They came back a couple of days later, picked it up, took it back down there to them, made a copy of it for me, brought me back the copy.

Referrals to Other Services

Patients served by care navigators were sometimes referred to primary care, specialists, and home health care. It was common for care navigators at 8 of the 10 CN sites to take the further step of scheduling appointments for patients to see specialists. Navigators across DSRIP project sites also connected patients with human services such as transportation and housing.

Business administrator at site A: Usually, when I make my initial phone call, I will tell them that, "This is [staff member] at [site A]. I saw where you'd come to the ER. Just wanted to let you know that we do have a clinic next door, if you don't have your physician. . . . If you would like, I could transfer you over there . . . to schedule that appointment."

Care navigation projects facilitated patients to see other providers to avoid future ED use:

Care navigator at site M: We paid for the co-pay. Actually, at this point we're willing to pay for as many PCP appointments within the 30 day period that they may need and their medications if needed.

Patient at site N: Last time I had a bad tooth, and he [care navigator] helped me. Got in contact for where I could go and get it pulled out. Right away . . . I only had $40.00. They put in the rest of it. He got it the next day. I mean, it was amazing what he was doing for me.

Care navigation also entailed connecting patients with necessary non-heath care services, including home health, health and human service agencies, legal assistance, nonprofit organizations, shelters, food pantries, resources centers, and local and regional transportation agencies. The evaluation team interpreted the high prevalence of comments about social services relief across sites as indicating how often patients' poverty profoundly affects their health conditions.

> Care navigator at site L: We work with the Health and Human Services for
> Medicaid or CHIP when children don't qualify for the Medicaid. We also
> refer to the Food Stamp Office, which is the same office. We do get a lot of
> people who come in who don't know if they qualify for Social Security. We
> review with them. We explain to them the disability rights and laws and
> qualifiers. Refer to the battered women's shelter. Refer to WIC.

> Care navigator at site E: Those are individuals that may be homeless or living
> from house-to-house in the community. Moved in, don't have a place to
> live, don't have a family member, and so they just stay with friends…. We
> may find them at a different place. We're able to connect them to another
> resource called [faith-based organization]. They have food and clothing.
> They'll buy them minutes for their phone to use for our appointments and
> things.

Follow-Up

Care navigators for all project sites attempted to make at least one phone call to follow-up with identified patients after an ED visit or other initial contact. In addition to follow-up phone calls, 6 out of 10 project sites made home visits. During follow-up phone calls or home visits, care navigators inquired if patients had received their prescribed medications, gone to recommended health care appointments, or received other services they needed.

> Care transitions coordinator at site M: We always do three phone calls. Each
> patient gets an initial home visit and three follow-up phone calls seven days
> apart. We just check on them. "How are you feeling? How's your sugar?
> How are you feeling with your medications? Doctor's appointments?" We
> don't really have to ask any more. They just volunteer all the information.

Some individuals with more complex needs required substantial time and resources, sometimes for long periods of time.

> Care navigator at site E: Not all the clients need the same amount. It
> depends on their needs and how unstable they are. We have one whom we
> do visit more frequently. She's needing a lot of help getting established and
> knowing how to care for herself and her chronic diseases. She has several.

Care navigators had to learn how to manage these challenging patients within their limited time and resources:

> Care navigator at site C: Over time, you tend to know where to direct the
> patients. They see you, they're, "Can you get me my insurance? Can you get
> me these things?" We're, "Okay. This is where we fit in. We can help direct
> you to where to get those."

Rurality

The histories of the four rural projects in the evaluation suggest that rural facilities had particular difficulties initiating and sustaining DSRIP CN projects. Of the four DSRIP project sites based in rural communities, one site was unable to initiate its approved care navigation project, one site closed, one greatly reduced the scope of CN services provided, and one strengthened community partnerships to offset the administrative burden on project staff. This fourth, ultimately most successful project, underwent numerous leadership transitions over the study period; however, project staff at this site credit their current success to collaboration with government agencies and community partners, like faith-based organizations and community members, to supplement the scope of CN services they were able provide.

Overall, the evaluation team identified three themes relating to rural challenges in initiating and maintain DSRIP CN projects:

- Funding and staffing shortages constrain new projects.
- Rural care navigation entails overcoming geographic barriers to service access.
- There are benefits and drawbacks to small communities where most residents know each other

Funding and Staffing Shortages

Administrators across all rural project sites reported difficulty recruiting and keeping qualified health care providers. A common theme across all rural sites, operational and non-operational, was the need for staff to "wear multiple hats," i.e., serve multiple roles, given funding and staffing shortages. Not only was this theme identified by comparison sites, but one DSRIP CN key informants attributed its inability to initiate its DSRIP CN project largely to staffing constraints, while another underwent repeated transitions in leadership over the study period. Yet another project site significantly reduced the scope of care navigation services currently provided.

Health Professional Shortage Area and Barriers to Access

Rural participants' perceptions of distinctive personnel-related challenges were partially supported by data indicating that three out of the four (75%) rural DSRIP CN projects were based in full counties designated as health professional shortage areas, versus 38% of non-rural projects. In keeping with the smaller scale of rural facilities, the average number of care navigation staff at rural sites was 1.5 full time equivalents, versus 4.7 at non-rural sites. However, the two rural DSRIP CN projects in existence at the end of the study period had experienced no turnover in the prior year, versus an average of 18% at non-rural sites. Hence, the most salient form of attrition among rural DSRIP CN sites may have been organizational rather than personnel, although the sample size involved caution in making inferences. The mean organizational tenure of DSRIP CN staff at rural sites was also 3.8 years, versus 7 years for staff at non-rural sites, which implies that rural sites may have been more likely to recruit new staff for these positions, perhaps because they may not have had existing personnel available to re-deploy into these new roles.

Hospital CEO at site J [the hospital that was unable to initiate its DSRIP CN project]: . . . you also have the constant struggle of maintaining providers, so you can provide the basic services that you're already offering . . . There are some full-time equivalents that I'd have to have. A nurse that's going to sit down there and track the patients as they do. I've got the nurses now that are in there and they handle the patient load that's coming in, but that's all part of taking care of the patient right then and there. The physicians are doing that, and the physicians aren't [going to] to sit down and do that paperwork. You [have got to] add people to do that. There's a cost that's associated with that.

Across DSRIP project sites, interviews revealed the need for staff to 'wear multiple hats' due to funding and staffing shortages.

Outreach nurse at site I: My most important job is doing community outreach for this waiver program. I'm over at the resource center, which is also our food pantry. I see patients there on Mondays, on Wednesdays and on Fridays. I have regular patients that just come in for many different things. Tuesday and Thursday I'm here at the hospital. I do cardiac and pulmonary rehab. I do infection control for the hospital. I do all of their flu shots, all of that to all the employees. In a small community you wear a bunch of hats.

Weakness and Strengths to Rural Social Networks

Key informants, project staff, and patients at rural sites described advantages and disadvantages of long-time personal mutual familiarity. Such relationships within rural communities can facilitate the informal provision of care, but can also prevent patients from seeking care due to concerns about privacy.

Care navigator at site P: Because it's a small community, we know almost everybody who comes in. I think we can take a lot better care of people, just already having all that previous history with the people that come in.

Administrator at Site A: I think [chief nursing officer] can probably tell you every patient and their name, and knows their extended family. I think that's what makes things also a little difficult for the medical screenings. You know who they are.

The evaluation team inferred from interviews with professionals at rural sites that they relied more than their more urban counterparts did on community resources. Key informants and staff at the rural site that appeared to have the most robust operations by 2016 (DY5) credited their success to collaboration with government agencies and community partners.

At the same time, even the administrator at the rural project with the strongest operations expressed concerns about both their ability to provide specific needed services and overall long term viability.

CN Project and Comparison Sites

The statistics below in Table 9 and 10 show that the study sites reflected variations in regional resource levels and population density.

Table 9. Attributes of DSRIP Emergency Department Care Navigation Sites in Final Sample (N=10)

	%	Count
RHP Tier[a]		
1	10	1
2	20	2
3	40	4
4	30	3
Trauma center level		
I	40	4
II	10	1
III	10	1
IV	40	4

Table 10. Attributes of the Final Sample Care Navigation Sites

	%	Count
Geographic category (based on RUCC)		
Urban	50	5
Mixed	30	3
Rural	20	2
Resource scarcity		
Critical access	10	1
Health care availability		
Health professionals shortage area (HPSA)	40	4
Type of lead provider		
Hospital-based	50	5
EMS-based	30	3
CMHC-based	20	2

Note: EMS indicates emergency medical service; CMHC, community mental health center; RUCC, rural urban continuum code as defined by the United States Department of Agriculture Economic Research Service. Trauma Center Levels in Texas range from Level I with comprehensive trauma care to Level IV with basic trauma care capabilities
[a]Tier 1 RHP indicates a regional health partnership (RHP) that contains more than 15% share of the statewide population under 200% of the federal poverty level (FPL) as defined by the U.S. Census Bureau: 2006-2010 American Community Survey for Texas (ACS). Tier 2 contains 7% – 15% share of the statewide population under 200% FPL. Tier 3 contains 3% – 7% share of the statewide population under 200% FPL. An RHP is classified in Tier 4 if one of the following three criteria are met: 1) the RHP contains less than 3% share of the statewide population under 200% FPL; 2) the RHP does not have a public hospital; or 3) the RHP has public hospitals that provide less than 1% of the region's uncompensated care.

The research team used publically reported numbers for DY4 statistics (https://public.tableau.com/profile/texashhsc#!/) as a prompt in the DY5 interviews with key informants, who either verified or modified those numbers.

Below are diagrams of two DSRIP CN sites, depicting extreme variations in their organizational structures and local contexts. These included a rural hospital-based project (Figure 6) and an EMS-based project (Figure 8).
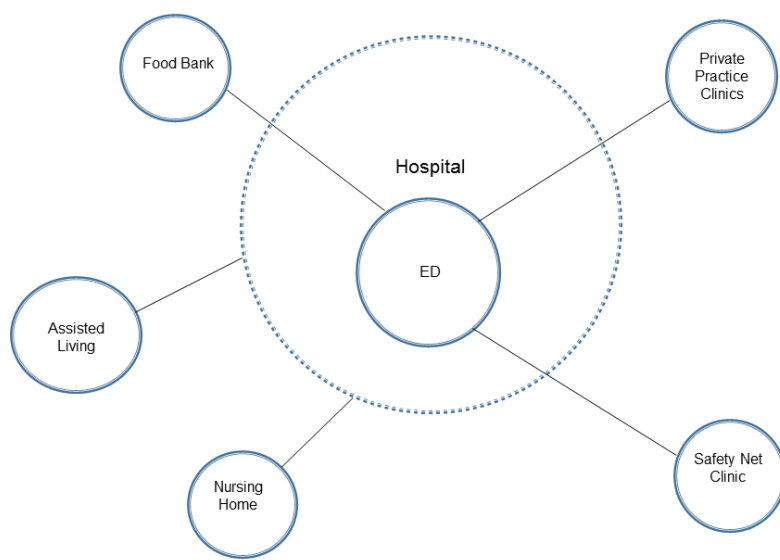
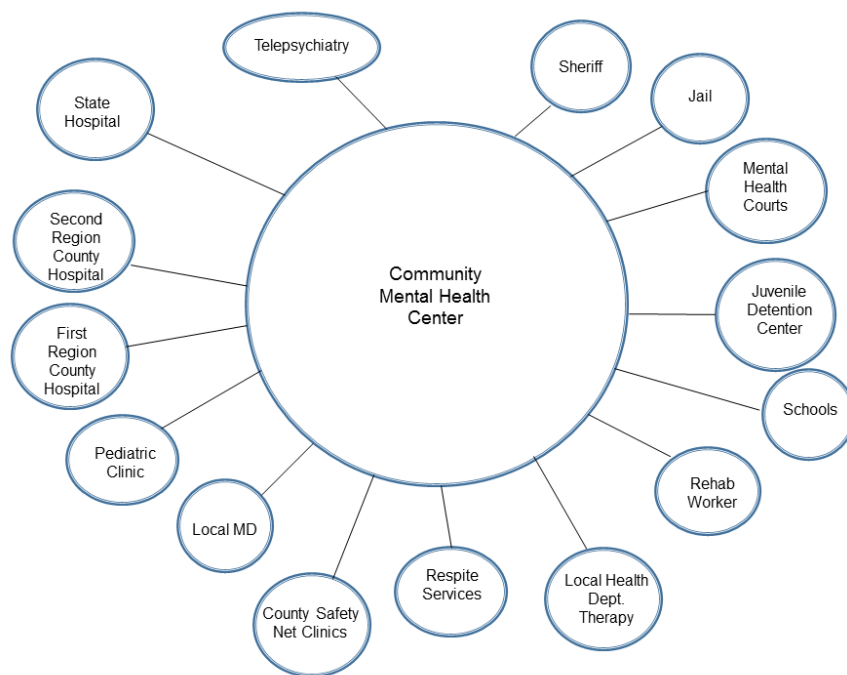Figure 6. Structure of a Rural Hospital-Based Project Site

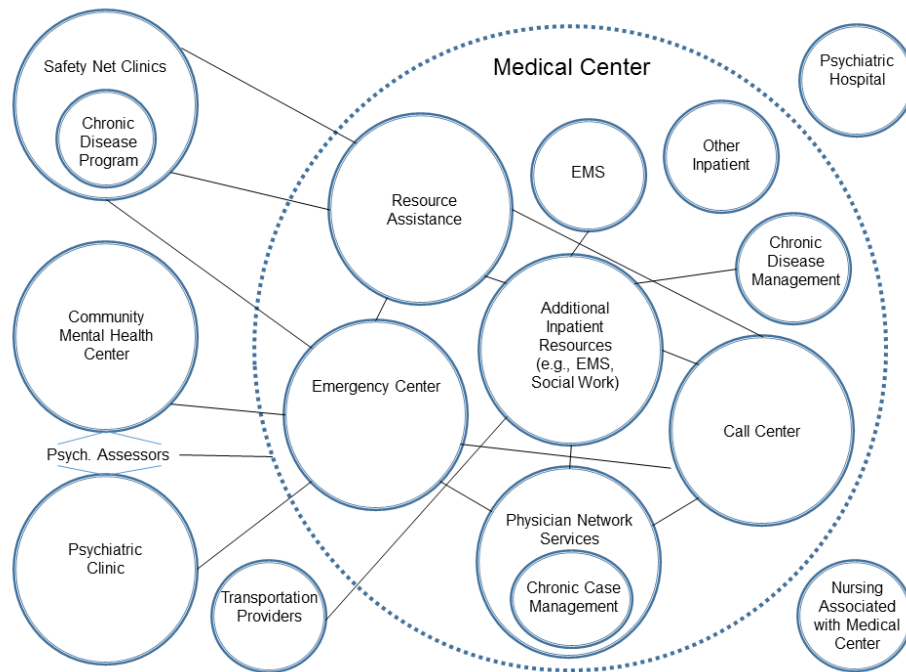Figure 7. Structure of a Community Mental Health Center-Based Project Site

Figure 8. Structure of an Emergency Medical Services-Based Project Site

Key Informant Characteristics

As previously noted, the research team sought whenever possible to interview the same individuals from year to year, although also deferring to key informants' judgement about whom to include in the interviews with staff members. The relatively low continuity in whom the team interviewed over time reflected frequently changing roles within DSRIP projects as well as some turnover. The professional backgrounds of staff at DSRIP CN and comparison sites are shown in Table 11 and Table 12.

Table 11. DSRIP Care Navigation Project Site Professional Representatives' Backgrounds (N=79 across 12 sites)[a]

Attributes	% or mean	SD	Count
Educational background			
RN or BSN	37%		29
Social work (bachelors or masters)	18%		14
Other, non-nursing degrees	46%		36
Number of participants per site			
Key informant	3		35
Care navigator/front line staff	4		44
Professional tenure			
Years at facility (range 0.1 - 30)	8	8	74
Years in current position (range 0-17)	3	4	64
Number of interviews with each individual			
1	63%		50
2	28%		22
3	9%		7

[a]10 original sites + 1 replacement for the site that was unable to initiate its approved DSRIP CN plan + 1 site that started as a comparison site and then began a DSRIP CN project.

Table 12. Comparison Site Professional Representatives' Backgrounds (N=37 across 9 sites)[a]

Attributes	% or mean	SD	Count
Educational background			
RN or BSN	51%		19
Other (none were social workers)	49%		18
Number of participants per site[b]	4		37
Professional tenure			
Years at facility (range: 0-35 years)	9	10	27
Years in current position (range: 0-8 years)	2	2	28
Number of interviews with each individual			
1	54%		20
2	27%		10
3	19%		7

[a]10 original sites - 1 site that started as a comparison site and then began a DSRIP CN project.
[b]Only key informants were interviewed at comparison sites because there were no DSRIP CN projects to investigate.

Patient Characteristics

There were some major differences in the characteristics of patients who participated in face-to-face interviews during the initial site visits and those who participated in the focus groups during the final site visits, including the proportion who participated in Spanish and the payer mix. However, there were also similarities, such as in age and the proportion living alone (Table 13 and Table 14).

Table 13. Background Attributes of DSRIP Care Navigation Patients Who Participated in Face-to-Face Interviews (N=48) During Initial Site Visits

	% or mean	Number yes
Age (range 18-86): mean	50	
Currently homeless	5%	2
Lived alone	17%	8
Participated in Spanish	17%	8
Race/ethnicity[a]		
Hispanic	38%	18
Non-Hispanic Black	35%	17
Non-Hispanic White	25%	12
Native American	4%	2
Educational attainment		
Neither high school nor GED	40%	19
High school/GED	35%	17
Some college/associates degree or higher	25%	12
Insurance type[a]		
No insurance	35%	16
Medicaid	30%	14
Medicare	20%	9
Private	7%	3
Other[b]	9%	4

[a] Because of rounding and multi-racial choice, the sum may not equal 100%
[b] "Other" category reflected site-specific payment support plans

Table 14. Background Attributes of DSRIP Care Navigation Patients Who Participated in Focus Groups (N=52) During Final Site Visits

	% or mean	Number yes
Age (range: 19-71): mean	47	
Housing instability in last year	21%	11
Lived alone	21%	11
Participated in Spanish	44%	23
Race/ethnicity[a]		
Hispanic	61%	31
Non-Hispanic Black	16%	8
Non-Hispanic White	24%	12
Native American	0	0
Educational attainment		
Neither high school nor GED	42%	21
High school/GED	42%	21
Some college/associates degree or higher	16%	8
Insurance type[a]		
No insurance	51%	25
Medicaid only	18%	9
Medicare only	4%	2
Dual: Medicaid & Medicare	12%	6
Private	6%	3
Other[b]	8%	4
Additional Information Collected for Focus Groups		
Have reliable transportation	69%	36
Self-reported health status		
Excellent	4%	2
Very good	23%	12
Fair	54%	28
Poor	13%	7
Health conditions		
High blood pressure	44%	23
Asthma	4%	2
COPD	10%	5
Diabetes	46%	24
Depression	40%	21
Bipolar disorder	15%	8
Schizophrenia	10%	5
Anxiety	31%	16
PTSD	6%	3
Annual income		
$0-14,999	85%	44
$15,000-34,999	12%	6
$35,000+	0%	0

[a] Because of rounding and multi-racial choice, the sum may not equal 100%
[b] "Other" category reflected site-specific payment support plans

Of 1,441 patients approached for the telephone survey, 437 patients (30%) from 13 sites participated in the phone survey, with 168 from DSRIP CN sites and 269 from comparison sites. Although this is unsurprising for a hard-to-reach population, this response rate raises concerns about non-response bias. In order to test for non-response bias, we used chi-square (categorical), t-tests (continuous), or Fisher's Exact Tests (small sample) to compare age, sex, ethnicity, language spoken, and insurance status between survey participants and non-participants for patients at facilities that provided these data in the rosters they sent for survey recruitment. Of 13 participating sites, six sites provided data on age (n=1,035 patients), three on sex (n=507), one on ethnicity (n=50), two on language (n=108), and four on health insurance status (n=580).

Among patients at the sites for which background data were available for both respondents and non-respondents, no significant differences were found in age of participants and non-participants (p= 0.92); sex (p=0.21); ethnicity (p=0.54) or language (p=0.57). The one difference was found for insurance status, with 15% of respondents and 38% of non-respondents having no insurance (p<0.001). In summary, despite the low participation rate in the telephone survey, the only significant difference found between the respondents and the non-respondents in attributes measures was related to insurance status.

As shown in Table 15, the majority of participants in the phone survey had multiple comorbidities.

Table 15. Disease Conditions Reported by Patients Who Participated in Telephone Survey[a]

Health conditions	DSRIP care navigation sites (N=168)		Comparison sites (N=269)		p	Combined sample (N=437)	
	%	Number Yes	%	Number Yes		%	Number Yes
Heart disease	22	37	25	68		24	105
High blood pressure	63	106	56	151		59	257
Lung disease	20	34	28	75	+	25	109
Diabetes	51	86	36	96	**	42	182
Ulcer or stomach disease	22	37	26	69		24	106
Kidney disease	12	20	14	37		13	57
Liver disease	11	19	11	29		11	48
Anemia or other blood disease	20	33	17	46		18	79
Cancer	3	5	5	14		4	19
Depression	55	92	57	154		56	246
Osteoarthritis, degenerative arthritis	20	34	28	74	+	25	108
Rheumatoid arthritis	22	37	22	58		22	95
Back pain	51	85	67	181	***	61	266
Other medical/mental problems	44	74	39	104		41	178
Mean total number of conditions		4		4		4	

[a]Sangha, Oliver, et al. "The self-administered comorbidity questionnaire: A new method to assess comorbidity for clinical and health services research." *Arthritis Care & Research* 49.2 (2003): 156-163

P-value reflects independent sample t-tests for continuous variables or chi-square tests for categorical variables.

$+ P \le .10$, $* P \le .05$, $** P \le .01$, $*** P \le .001$

The self-reported disease condition profiles of patients in DSRIP CN and comparison sites were very similar, with the exceptions of diabetes, which was more common among patients in DSRIP CN sites (51%) than among patients in comparison sites (36%), and back pain, which was less common in DSRIP CN sites (51%) than in comparison sites (67%).

Care Navigation - Quantifiable Patient Impact of Case Sites

As with DSRIP projects overall, CN case study projects had goals related to serving the MLIU population and increasing the number of individuals served through their projects. Table 16 displays the MLIU population and QPI data for the 10 CN case sites. Overall, these 10 projects aimed to serve a population comprised of over 60% MLIU individuals. In DY3, the overall goal was met as 62.4% of the population served was MLIU, but fell short in DY4 and DY5 as 56.9% and 55.4%, respectively, of the population served was MLIU. In DY3 and DY4, four of the ten sites met their MLIU goal, while only 1 site met their MLIU goal in DY5. (These metrics are current as of February 28, 2017; however, performing providers may continue to report achievement of DY5 QPI through October 31, 2017.

In terms of QPI, all ten sites with DSRIP CN projects selected individual-level QPI measures. Collectively, they aimed to serve 3,823; 7,256; and 14,007 individuals in DY3, DY4, and DY5, respectively. The ten projects served 9,860; 12,115; and 17,256 individuals in DY3, DY4, and DY5, respectively, surpassing the aggregate goal in all three years. The majority of sites met their individual-level QPI goal in DY3 though DY5. As stated above, performing providers may continue to report achievement of DY5 QPI through October 31, 2017.

Table 16. Care navigation - quantifiable patient impact of case sites

			DY3	DY4	DY5**
	Number of active projects (cases)		9	10	10
INDIVIDUALS	QPI Goal	Total number of individuals projects aimed to serve***	3,823	7,256	14,007
		Median(range) number of individuals projects aimed to serve	120 (2,590)	185 (5,180)	305 (10,660)
	QPI Actual	Total number of individuals projects served	9,860	12,115	17,256
		Median(range) number of individuals projects served	136 (8,024)	107 (7,532)	155 (10,824)
		QPI goal met (# projects)	8	9	7
Population		Goal: % Medicaid + Low-income uninsured (mean)	61.0%	63.9%	63.9%
		Actual: % Medicaid + Low-income uninsured (mean)	62.4%	56.9%	55.4%

* Reported ach

** DY5 data may be incomplete due to carry-forward requests

*** Baseline was approximately 250 for one project and 0 for all others.

Organizational and Local Contexts

Below are results from regression models estimating outcomes of dimensions of system capacity outlined within Wagner's chronic care model (one of which—patient self-reported use of health records, overlaps with Coleman's care transitions model, and hence is included in the regression models for each). Due to the very small number of patients in rural areas who participated in the phone survey, it was not possible to estimate the effects of rurality on outcomes.

Contextual Factors as Predictors of Health Care Quality

Table 17. Multiple Regression Models of the Association Between Project Alignment with Wagner's Chronic Care Model and Quality of Care

	Quality outcomes					
	Information about treatment options logistic coefficient	p-value	Information about patient rights logistic coefficient	p-value	Able to refuse care or medication logistic coefficient	p-value
Key independent variables						
Number of CN key partners	0.03		0.04		0.41	
Organizational support	1.20		-0.17		-3.66	
Patient use of health record	0.54		0.47		-0.03	
CN staff role clarity	2.11	*	0.36		1.31	
Staff training for care navigator	0.13		1.31		2.79	
EMR flags care navigator about patient needs	-1.05		-0.53		-0.65	
Covariates						
Comorbidity index	0.20	+	0.19		0.07	
Comorbidity index-squared	-0.01		-0.01		-0.00	
Uninsured, relative to Medicaid	0.40		0.59		0.34	
Other insurance, relative to Medicaid	-0.65		0.70		-0.12	
Patient age	0.01		-0.06	***	0.00	
Non-Hispanic Black	0.47		-0.41		0.30	
Non-Hispanic White	0.94		1.27		0.24	
High school education or more	1.10	*	0.10		0.49	
CMHC-based project	-1.42	*	-1.94	*	-0.37	
EMS-based project	-0.03		0.20		1.62	
N	167		167		167	
F-test	16.7	*	4.2		4.1	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

In Table 17, the F-tests indicate that collectively, the key independent variables were significantly associated only with patient-reported information about treatment options, an association that appears to be driven by CN staff role clarity: In this sample, average marginal effects estimates indicate that patients in sites where care navigators had high role clarity had a 55 percentage points higher probability of reporting they had information about the different kinds of education or treatment that were available than patients where care navigators had lower role clarity (Table 17). CN often functions at the interstices of care. Hence, role clarity may be particularly important to fulfilling this role effectively. This corroborates prior research finding that staff role clarity affects care coordination (Hemsley & Balandin, 2014; Nosbusch, Weiss, & Bobay, 2010; Roch, Dubois, & Clark, 2014; and Wheeler et al., 2009).

Table 18. Multiple Regression Models of the Association Between Project Alignment with Wagner's Chronic Care Model and Quality of Care

	Quality outcomes			
	Access to health care	p-value	Agreement between providers	Personal doctor up-to-date on care from other providers
	OLS coefficient		logistic coefficient	
Key independent variables			*Insufficient sample for estimation*	*Model did not converge*
Number of care navigator key partners	-0.01			
Organizational support	-0.28			
Patient use of health record	0.27	+		
CN staff role clarity	-0.01			
Staff training for care navigator	0.45			
EMR flags care navigator about patient needs	-0.18			
Covariates				
Comorbidity index	0.00			
Comorbidity index-squared	0.00			
Uninsured, relative to Medicaid	-0.13			
Other insurance, relative to Medicaid	-0.23			
Patient age	0.01			
Non-Hispanic Black	0.15			
Non-Hispanic White	-0.53			
High school education or more	-0.17			
CMHC-based project	0.12			
EMS-based project	-0.13			
N	167		64	
F-test	0.97			

Note: EMS indicates emergency medical services; CMHC, community mental health center.
The joint F-test tests the statistical significance of the key independent variables as a set.
The potential sample for the model predicting agreement among providers is only 64 because the question about agreement among providers was only applicable to the 232 out of the total of 437 patients surveyed who had indicated that they had multiple providers; only 72 of those 232 individuals were in DSRIP CN sites, and most of the independent variables were collected only for DSRIP CN sites; and finally, the eight patients at CMHCs were dropped from the model because of perfect prediction (i.e., all eight indicated that their providers agreed most or all of the time).
+ $P \leq .10$, * $P \leq .05$, ** $P \leq .01$, *** $P \leq .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

On average, patients who reported using their personal health records with different providers (such as doctors' offices or hospitals) perceived slightly higher access to health care (0.27, on a 0 – 4 scale) (Table 18).

Contextual Factors as Predictors of Health

Table 19. Multiple Regression Models of the Association Between Organizational Structure and Health

	Health outcomes			
	Physical health (SF-8™) OLS coefficient	p-value	Mental health (SF-8™) OLS coefficient	p-value
Key independent variables				
Number of CN key partners	-0.01		-0.16	
Organizational support	-1.24		3.25	
Patient use of health record	2.52		-1.77	
CN staff role clarity	2.18		12.87	*
Staff training for care navigator	2.62		-3.24	
EMR flags care navigator about patient needs	-3.73		4.37	
Covariates				
Comorbidity index	-1.58	**	-1.14	+
Comorbidity index-squared	0.04	+	-0.01	
Uninsured, relative to Medicaid	-1.01		0.18	
Other insurance, relative to Medicaid	0.43		0.95	
Patient age	-0.01		-0.05	
Non-Hispanic Black	-1.46		2.20	
Non-Hispanic White	-2.11		2.88	
High school education or more	-0.10		0.99	
CMHC-based project	4.06		-5.24	
EMS-based project	-0.38		-2.37	
N	156		167	
F-test	1.01		2.03	+

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$,   * $P \le .05$,   ** $P \le .01$,   *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

As Table 19 shows, patients in sites where care navigators had high role clarity on average reported better mental health.

Contextual Factors as Predictors of Costs

Table 20. Multiple Regression Models of the Association Between Organizational Structure and Costs

	Cost outcomes		
	Visited ED in the last month	p-value	Would go to ED again for the same issue (excluding unintentional injury)
	logistic coefficient		logistic coefficient
Key independent variables			*Model did not converge*
Number of CN key partners	0.11		
Organizational support	-0.33		
Patient use of health record	-1.09	*	
CN staff role clarity	0.71		
Staff training for care navigator	-0.42		
EMR flags care navigator about patient needs	1.73	*	
Covariates			
Comorbidity index	-1.32	*	
Comorbidity index-squared	-2.67	***	
Uninsured, relative to Medicaid	-1.37	**	
Other insurance, relative to Medicaid	2.49	***	
Patient age	0.00		
Non-Hispanic Black	-0.01		
Non-Hispanic White	-0.06		
High school education or more	-1.07	*	
CMHC-based project	0.57		
EMS-based project	-1.11		
N	164		
F-test	11.6	+	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \leq .10$, * $P \leq .05$, ** $P \leq .01$, *** $P \leq .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

In Table 20, the F-test indicates that collectively, the key independent variables were significantly associated with recent ED visits. Effect sizes for significant individual coefficients are explained below.

Based on results in Table 20, average marginal effects estimation indicates that patients in this sample who reported using a personal health record to help track and manage their health care had a 15 percentage points lower probability of having been in the ED in the last month, holding other covariates constant.

PROCESSES

Models Associated with Improved Health Care Quality

One of the strengths of the current evaluation was the disaggregation of CN into component processes, in addition to testing the effects of DSRIP CN as a whole as shown in the "Outcomes" section. The tables below show associations between a number of specific care navigation processes and quality, health, and costs. The first set of processes are those outlined within Coleman's care transitions model.

Coleman's Care Transitions Model Care Processes as Predictors of Health Care Quality

Table 21. Multiple Regression Models of the Association Between Coleman's Care Transitions Processes and Quality of Care

	Quality outcomes					
	Information about treatment options logistic coefficient	p-value	Information about patient rights logistic coefficient	p-value	Able to refuse care or medication logistic coefficient	p-value
Key independent variables						
Knows what medications do	1.41	+	-0.17		-0.04	
Uses personal health record	0.81	***	0.49		0.37	
Follows up on appointments	-0.06		-0.47		0.40	
Has enough information to manage health condition	1.15	***	1.93	***	0.53	*
Covariates						
Comorbidity index	0.18	***	0.09		0.07	
Comorbidity index-squared	-0.01	**	-0.00		-0.00	
Uninsured, relative to Medicaid	0.33		0.59		-0.02	
Other insurance, relative to Medicaid	-0.22		0.31		-0.06	
Patient age	0.00		-0.04	**	-0.01	
Non-Hispanic Black	0.10		0.49		0.66	*
Non-Hispanic White	-0.21		0.88	*	0.82	*
High school education or more	0.38		0.00		0.53	*
CMHC-based project	-0.40		-1.15		-0.49	
EMS-based project	0.55		-0.16		-0.13	
N	431		431		431	
F-test	42.51	***	47.39	***	11.35	*

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \leq .10$,   * $P \leq .05$,   ** $P \leq .01$,   *** $P \leq .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

In Table 21, the F-tests indicate that collectively, the key independent variables were significantly associated with all three dependent variables.

Based on results in Table 21, the average marginal effects estimate indicates that patients in this sample who reported understanding the purpose of each of their medications had a 29 percentage points higher probability of reporting that they had information about the different kinds of education or treatment that were available than patients who did not respond affirmatively to this question (i.e., that they understood the purpose of each of their

medications), holding other covariates constant. Patients who reported using a personal health record to help track and manage their health care had a 17 percentage points higher probability of reporting that they had information about the different kinds of education or treatment that were available than patients who did not respond affirmatively to this question (i.e., that they used a personal health record).

The average marginal effect estimate also indicates that patients who reported having as much information as they wanted about what they could do to manage (control) their condition had a 25 percentage points higher probability of reporting they had information about the different kinds of education or treatment available than patients who did not respond affirmatively to this question (i.e., that they had as much information as they wanted about what they could do to manage their condition); a 27 percentage points higher probability of reporting that they had information about their rights as a patient than patients who did not respond affirmatively to this question; and a 10 percentage points higher probability of reporting that they were able to refuse a specific type of medication, test, or treatment than patients who did not respond affirmatively to this question (i.e., that they had as much information as they wanted about what they could do to manage their condition).

Interviews with care navigators and staff depict services that often helped patients, including those outlined within Coleman's care transitions model, even though they may not have yielded measurable impact on average, in part because of patients' depth and complexity of needs.

> Hospital executive at site T: [the project] continues to be challenged by the sheer volume of uninsured and low income patients requiring primary care services, as well as socioeconomic factors such as lack of transportation, housing issues, and language barriers that impacted a large percentage of patients and present an additional challenge when attempting to follow-up and connect them with needed resources.

> Care navigator at site L: That's been the thing that I found when I first started this project was the realization of how many barriers there are that patients encounter.

Other challenges included working around both patients' and providers' schedules, accommodating patients who did not come for appointments, and some difficulties in engaging patients.

Table 22. Multiple Regression Models of the Association Between Care Navigator Interactions with Patients and Quality of Care

	Quality outcomes					
	Information about treatment options logistic coefficient	p-value	Information about patient rights logistic coefficient	p-value	Able to refuse care or medication logistic coefficient	p-value
Key independent variables						
Care navigator saw patient at home	-1.25	**	0.82		0.31	
Care navigator called patient at least once	-0.05		-0.69		-0.72	
Covariates						
Comorbidity index	0.35	**	0.04		0.13	
Comorbidity index-squared	-0.01	**	-0.00		-0.00	
Uninsured, relative to Medicaid	0.37		-0.15		-0.61	
Other insurance, relative to Medicaid	-0.66		1.57		0.06	
Patient age	0.01		-0.09	**	-0.02	
Non-Hispanic Black	-0.40		-0.20		0.63	
Non-Hispanic White	-0.20		1.22		1.21	
High school education or more	-0.99	*	-0.13		0.53	
CMHC-based project	-0.51		-2.96	*	-1.02	
EMS-based project	1.30	+	0.54		-0.12	
N	143		143		143	
F-test	8.21	*	2.65		2.16	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

Coleman's care transitions model specifies minimum numbers of care navigator in-person and phone contacts with patients. Based on results in Table 22, the average marginal effects estimate indicates that patients in this sample who reported being visited at home by care navigators had a 22 percentage points *lower* probability of reporting that they understood treatment options than patients who did not respond affirmatively to this question (i.e., that they were visited at home care navigators), holding other covariates constant. This result could reflect care navigators focusing home visits on patients with more complex needs, including potential difficulty understanding treatment options.

Table 23. Multiple Regression Models of the Association Between Patient Perception of Coordination with their Care Navigator and Quality of Care

	Quality outcomes					
	Information about treatment options logistic coefficient	p-value	Information about patient rights logistic coefficient	p-value	Able to refuse care or medication logistic coefficient	p-value
Key independent variable						
Patient perceptions of the quality of coordination with their care navigators	0.50	**	0.05		0.14	
Covariate						
Comorbidity index	0.32	**	0.07		0.14	
Comorbidity index-squared	-0.01	**	-0.00		-0.00	
Uninsured, relative to Medicaid	0.14		-0.32		-0.69	
Other insurance, relative to Medicaid	-0.68		1.43		-0.31	
Patient age	0.00		-0.08	**	-0.02	
Non-Hispanic Black	-0.51		0.02		0.77	
Non-Hispanic White	-0.78		1.34		1.43	+
High school education or more	1.13	*	-0.16		0.71	+
CMHC-based project	-1.10		-2.69	*	-0.79	
EMS-based project	0.81		1.03		0.10	
N	157		157		157	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \leq .10$, * $P \leq .05$, ** $P \leq .01$, *** $P \leq .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

The relational coordination instrument was used to measure patient perceptions of coordination with their care navigators, with the expectation that better patient-care navigator coordination would lead to better outcomes. Based on results in Table 23, the average marginal effects estimate indicates that patients in this sample with above average perceptions of interactions with their care coordinator (i.e., responses of 3 or 4 on a 0 – 4 scale) had about a 13 percentage points higher probability of reporting that they had information about the different kinds of treatment, holding other covariates constant.

Table 24. Multiple Regression Models of the Association Between Patient-Developed Care Plan and Quality of Care

	Quality outcomes					
	Information about treatment options logistic coefficient	p-value	Information about patient rights logistic coefficient	p-value	Able to refuse care or medication logistic coefficient	p-value
Key independent variable						
Care navigators report developing plans with patient	1.70	**	-0.29		-0.15	
Covariates						
Comorbidity index	0.19	+	0.17		0.05	
Comorbidity index-squared	-0.01		-0.01		-0.00	
Uninsured, relative to Medicaid	0.31		0.49		0.32	
Other insurance, relative to Medicaid	-0.83	+	0.42		-0.05	
Patient age	0.01		-0.06	***	0.01	
Non-Hispanic Black	0.33		-0.23		0.57	
Non-Hispanic White	0.56		0.93		0.26	
High school education or more	1.04	*	0.10		0.58	
CMHC-based project	-1.07	+	-1.41	*	-0.13	
EMS-based project	1.42	*	0.07		-0.05	
N	167		167		167	

Note: EMS indicates emergency medical services; CMHC, community mental health center
+ $P \leq .10$, * $P \leq .05$, ** $P \leq .01$, *** $P \leq .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

Based on results in Table 24, the average marginal effects estimate indicates that patients in this sample in sites where care navigators reported developing plans with patients had a 32 percentage points higher probability of reporting that they had information about the different kinds of education or treatment that were available than patients who did not respond affirmatively to this question (i.e., that they had developed a plan with their care navigator), holding other covariates constant.

Table 25. Multiple Regression Models of the Association Between Scope of Project Reported by Care Navigators and Quality of Care

	Quality outcomes				
	Information about treatment options logistic coefficient	p-value	Information about patient rights logistic coefficient	Able to refuse care or medication logistic coefficient	p-value
Key independent variables			*Model did not converge*		
Average number of months patients receive care navigation, according to staff	-0.17			0.23	
Patients had evening or weekend access to care navigators, according to staff	-0.45			-0.18	
When needed, care navigators provide transportation to health care, according to staff	2.27	**		0.07	
Communicate with ED about patients, according to staff	-0.21			0.59	
Covariates					
Comorbidity index	0.17	+		0.38	
Comorbidity index-squared	-0.00			0.06	
Uninsured, relative to Medicaid	0.39			0.31	
Other insurance, relative to Medicaid	-0.68			-0.17	
Patient age	0.01			0.01	
Non-Hispanic Black	0.43			0.20	
Non-Hispanic White	0.64			0.08	
High school education or more	1.14	**		0.53	
CMHC-based project	-2.00			-0.90	
EMS-based project	-0.30			-0.45	
N	167			167	
F-test	13.33	*		6.38	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

In Table 25, the F-tests indicate that collectively, the key independent variables were marginally statistically significantly associated only with information about treatment options. This appears to be driven by care navigator transportation of patients.

Based on results in Table 25, the average marginal effects estimate indicates that patients in this sample in sites where care navigators sometimes provided transportation to appointments had a 41 percentage points higher probability of reporting that they had information about the different kinds of education or treatment available than patients who did not respond affirmatively to this question, holding other covariates constant.

Conversely, several projects increased the intensity of DSRIP CN to meet needs of people with complex conditions.

In general, staff and patients also described care navigation as varying according to patients' individual needs:

Table 26. Multiple Regression Models of the Association Between Patient Access to Information and Quality of Care

	Quality outcomes			
	Access to health care *Model did not converge*	Agreement between providers logistic coefficient	p-value	Personal doctor up-to-date on care from other providers *Model did not converge*
Key Independent variables				
Knows what medications do		-0.56		
Uses personal health record		0.41		
Follows up on appointments		-0.09		
Has enough information to manage health condition		0.79	**	
Covariates				
Comorbidity index		-0.16	+	
Comorbidity index-squared		0.00		
Uninsured, relative to Medicaid		-0.08		
Other insurance, relative to Medicaid		0.06		
Patient age		0.02	+	
Non-Hispanic Black		0.17		
Non-Hispanic White		-0.40		
High school education or more		-0.43		
CMHC-based project		omitted	NA	
EMS-based project		-0.28		
N		219		
F-test		8.48	+	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

In Table 26, the F-test indicates that collectively, the key independent variables were associated with agreement between providers. This overall association appears to be driven by whether patients reported having enough information to manage their health conditions.

Based on results in Table 26, the average marginal effects estimate indicates that patients who reported having as much information as they wanted about what they could do to manage (control) their condition had a 17 percentage points higher probability of reporting that providers agreed with each other on the best way to manage the patient's health condition than patients who did not report having as much information as they wanted about what they could do to manage (control) their condition.

Table 27. Multiple Regression Models of the Association Between Patient Perception of Quality of Coordination With Their Care Navigator and Quality of Care

	Quality outcomes				
	Access to health care OLS coefficient	p-value	Agreement between providers logistic coefficient	p-value	Personal doctor up-to-date on care from other providers *Model did not converge*
Key independent variable					
Patient perceptions of the quality of coordination with their care navigators	0.24	***	0.73	***	
Covariate					
Comorbidity index	0.00		0.01		
Comorbidity index-squared	-0.00		-0.00		
Uninsured, relative to Medicaid	-0.09		1.48		
Other insurance, relative to Medicaid	0.01		-0.08		
Patient age	0.02	**	0.01		
Non-Hispanic Black	0.21		1.23		
Non-Hispanic White	-0.06		0.30		
High school education or more	0.06		-0.97		
CMHC-based project	0.27		omitted		
EMS-based project	-0.14		-0.09		
N	157		79		

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

Access to preventive care was the mean of patient responses to four CAHPS® items (e.g., "At this point, how often is it easy to get the care, tests, or treatment you think you need?"), whereas agreement among providers was a single item ("How often is it easy to get providers to agree with each other on the best way to manage your health condition?") (see Table 8). The four questions were: (1) How often is it easy to get the care, tests, or treatment you think you need? (2) How often is it easy for you to get appointments with specialists? (3) When you needed care right away for an illness, injury, or condition, how often did you get care as soon as you needed? and (4) How often was it easy to get providers to agree with each other on the best way to manage your health condition?

As shown in Table 27, each 1 unit increase in patient perceived quality of coordination with their care navigator on a 0 – 4 scale was associated with a 0.24 unit increase in perceived access, also on a 0 – 4 scale. Also based on results in Table 27, average marginal effects estimation indicated that patients with above average perceptions of the quality of their interactions with the care navigators had a 31 percentage points higher probability of reporting that providers agreed with each other on the best way to manage the patient's health condition.

Table 28. Multiple Regression Models of the Association Between Patient-Developed Care Plan and Quality of Care

	Quality outcomes					
	Access to health care OLS coefficient	p-value	Agreement between providers logistic coefficient	p-value	Personal doctor up-to-date on care from other providers logistic coefficient	p-value
Key independent variable						
Care navigators report developing plans with patient	0.06		-0.55		2.73	+
Covariates						
Comorbidity index	0.00		-0.00		-0.60	
Comorbidity index-squared	-0.00		-0.00		0.02	
Uninsured, relative to Medicaid	-0.09		-0.08		0.82	
Other insurance, relative to Medicaid	-0.27		-1.13		1.43	*
Patient age	0.00		0.06	+	0.08	
Non-Hispanic Black	0.18		0.45		1.52	
Non-Hispanic White	-0.60	*	-1.36		omitted	NA
High school education or more	-0.13		-0.41		2.21	+
CMHC-based project	0.10		omitted	NA	-1.79	
EMS-based project	-0.10		-0.18		1.53	
N	167		64		68	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \leq .10$, * $P \leq .05$, ** $P \leq .01$, *** $P \leq .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

Based on results in Table 28, average marginal effects estimation indicated that in this sample, when care navigators reported developing care plans with their patients, patients had a 26 percentage points higher probability of reporting that providers were always informed and up-to-date about care received from other doctors or health providers than did patients in care navigation projects that did not engage patients in developing the care plan.

Interviews indicated that care navigation provided an opportunity for care navigators to get to know each patient and to problem solve with them based on what would work best for each patient.

Table 29. Multiple Regression Models of the Association Between Scope of Care Navigation Practice Reported by Care Navigators and Quality of Care

	Quality outcomes				
	Access to health care	p-value	Agreement between providers	p-value	Personal doctor up to date
	OLS coefficient		logistic coefficient		*Model did not converge*
Key independent variables					
Average number of months patients receive care navigation, according to staff	0.06		1.82	***	
Patients had evening or weekend access to care navigators, according to staff	-0.51		-1.02		
When needed, care navigators provide transportation to health care, according to staff	0.18		-0.43		
Communicate with ED about patients, according to staff	-0.39		-3.45	*	
Goes with patient to appointments	0.34		2.04	+	
Covariates					
Comorbidity index	0.00		0.11		
Comorbidity index-squared	0.00		-0.01		
Uninsured, relative to Medicaid	-0.13		-0.16		
Other insurance, relative to Medicaid	-0.28		-1.36		
Patient age	0.00		0.07	*	
Non-Hispanic Black	0.21		-0.32		
Non-Hispanic White	-0.58	*	-1.68		
High school education or more	-0.16		-0.44		
CMHC-based project	0.26		omitted	NA	
EMS-based project	-0.10		-0.33		
N	167		64		
F-test	0.62		80.53	***	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

In Table 29, the F-tests indicate that collectively, the key independent variables were significantly associated with agreement among providers. Effect sizes for significant individual coefficients are explained below.

Based on the results in Table 29, average marginal effects estimation indicates that each month of care navigation generally provided by a DSRIP CN project (that is, the average reported by staff) was associated with a 33% higher probability that its patients would report agreement between their providers. In contrast, when care navigators reported communicating directly with the emergency department staff regarding patients, average marginal effects estimated a 15 percentage points *lower* probability of patients reporting that providers agreed with each other on the best way to manage the patient's health condition. At sites where care navigators

reported sometimes accompanying patients to appointments, patients had a 13 percentage points higher probability of reporting that providers agreed with each other.

Care Navigation Processes and Emergency Department Use

Table 30. Multiple Regression Models of the Association Between Patient Access to Information and Costs

	Cost outcomes			
	Visited ED in the last month	p-value	Would go to ED again for the same issue (excluding unintentional injury)	p-value
	logistic coefficient		logistic coefficient	
Key Independent variables				
Knows what medications do	-0.63		0.26	
Uses personal health record	0.12		0.14	
Follows up on appointments	0.13		-0.06	
Has enough information to manage health condition	-0.27		0.10	
Covariates				
Comorbidity index	0.10	+	-0.00	
Comorbidity index-squared	-0.00		-0.00	
Uninsured, relative to Medicaid	-0.74	**	1.19	+
Other insurance, relative to Medicaid	-0.76	**	-0.25	
Patient age	-0.04	+	0.02	
Non-Hispanic Black	0.51	+	0.79	
Non-Hispanic White	0.75	**	0.20	
High school education or more	-0.38		-0.28	
CMHC-based project	0.70		-0.94	
EMS-based project	-0.45		-0.25	
N	419		394	
F-test	2.37		0.37	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \leq .10$, * $P \leq .05$, ** $P \leq .01$, *** $P \leq .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

Tables 30 through 32 show null associations between CN processes and patients' ED use.

Table 31. Multiple Regression Models of the Association Between Care Navigator Interactions with Patients and Costs

	Cost outcomes			
	Visited ED in the last month logistic coefficient	p-value	Would go to ED again for the same issue (excluding unintentional injury) logistic coefficient	p-value
Key Independent variables				
Care navigator saw patient at home	0.10		1.05	
Care navigator called patient at least once	0.16		-1.02	
Covariates				
Comorbidity index	-0.17	+	-0.26	
Comorbidity index-squared	0.01		0.01	
Uninsured, relative to Medicaid	-0.86	+	omitted	NA
Other insurance, relative to Medicaid	-0.80	+	-0.07	
Patient age	-0.03		-0.05	
Non-Hispanic Black	0.28		0.75	
Non-Hispanic White	1.18	*	-1.09	
High school education or more	-0.84	+	1.39	
CMHC-based project	0.49		-1.38	
EMS-based project	-0.40		-1.27	
N	142		85	
F-test	0.6		0.76	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.
The joint F-test tests the statistical significance of the key independent variables as a set.

Table 32. Multiple Regression Models of the Association Between Patient Perception of Quality of Coordination with Care Navigator and Costs

	Cost outcomes			
	Visited ED in the last month logistic coefficient	p-value	Would go to ED again for the same issue (excluding unintentional injury) logistic coefficient	p-value
Key independent variable				
Patient perceptions of the quality of coordination with their care navigators	0.15		0.55	
Covariate				
Comorbidity index	-0.16	+	-0.32	
Comorbidity index-squared	0.00		0.01	
Uninsured, relative to Medicaid	-0.85	+	omitted	NA
Other insurance, relative to Medicaid	-0.66		-0.41	
Patient age	-0.03	+	0.05	
Non-Hispanic Black	0.28		0.99	
Non-Hispanic White	1.18	*	-0.21	
High school education or more	-0.80	+	1.27	
CMHC-based project	0.46		-0.25	
EMS-based project	-0.53		-1.28	
N	154		98	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ *P* ≤ .10, * *P* ≤ .05, ** *P* ≤ .01, *** *P* ≤ .001 Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

OUTCOMES

Quality of Care

Table 33. Health Care Quality Descriptive Statistics From the Patient Telephone Survey

Patient understanding of health care options	DSRIP care navigation sites (N=168)		Comparison sites (N=269)			Combined sample (N=437)	
Experience of Care and Health Outcomes (ECHO™) survey items Response options: Yes /No							
	% yes / mean response	Number yes / mean response	% yes / mean response	Number yes / mean response	P-value	% yes / mean response	Number Yes / mean response
At this point, do you have information about different kinds of education or treatment that are available?	64%	108	58%	155		60%	263
At this point, do you have information about your rights as a patient?	82%	138	85%	229		84%	367
At this point, do you feel able to refuse a specific type of medication, test, or treatment?	71%	119	79%	212	+	76%	331
Access to Health Care from Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey items: Response options: Never (0)/ Rarely (1) / Some of the time (2) / Most of the time (3) / All of the time (4)							
How often is it easy to get the care, tests, or treatment you think you need?	2.9	most of the time	3.0	most of the time		2.9	most of the time
How often is it easy for you to get appointments with specialists?	2.6	most of the time	2.8	most of the time	+	2.8	most of the time
How often do you get care as soon as you need it?	3.1	most of the time	3.3	most of the time		3.2	most of the time
Not counting the times you needed care right away, how often did you get an appointment as soon as you thought you needed?	2.9	most of the time	3.1	most of the time		3.0	most of the time
Composite scale of CAHPS access items (alpha=.76)							
Provider Awareness Of Patient Needs							
Do you get care from a doctor or other health provider besides your personal doctor? Response options: Yes/No	48%	72	64%	160	**	53%	232
How often is it easy to get providers to agree with each other on the best way to manage your health condition? Response options: Never (0) / Rarely (1) / Some of the time (2) / Most of the time (3) / All of the time (4)	2.7	most of the time	2.9	most of the time		2.8	most of the time
Is your personal doctor usually or always informed and up-to-date about the care you received from other doctors or health providers Response options: Yes/No N=72	81%	123	88%	218	+	78%	341

P-values reflect independent sample t-test for continuous variable or chi-square test for categorical variables
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$

Patients reported care navigation as a positive experience. Table 33 shows patient responses to survey questions corroborating qualitative reports of patients being generally satisfied with their health care experiences. These responses were generally comparable between sites with and without DSRIP CN; however, most of the comparison sites were also implementing other DSRIP project types intended to improve health care quality.

Self-Reported Health

Table 34. Health Outcomes Descriptive Statistics From Patients' Responses to the Telephone Survey

Physical and mental health and functioning: SF-8™ Items	DSRIP care navigation sites (N=168)		Comparison sites (N=269)			Combined sample (N=437)	
	Mean	Mean response	Mean	Mean response	P-value	Mean	Mean response
During the past 4 weeks, overall, how would you rate your health? *Response Options: Very Poor (1) / Poor (2) / Fair (3) / Good (4) / Very good/Excellent (6)*	3.4	fair	3.3	fair		3.3	fair
During the past 4 weeks, how much did physical health problems limit your usual physical activities, such as walking or climbing stairs? *Response options: Could not do physical activities (1) / Quite a lot (2) / Somewhat (3) / Very little (4) / Not at all (5)*	2.9	somewhat	3.0	somewhat		3.0	somewhat
During the past 4 weeks, how much difficulty did you have doing your daily work, both at home and away from home because of your physical health? *Response options: Could not do daily work (1) / Quite a lot (2) / Some (3) / A little bit (4) / None at all (5)*	2.9	some	3.0	some		3.0	some
During the past 4 weeks, how much bodily pain have you had? *Response options: Very severe (1) / Severe (2) / Moderate (3) / Mild (4) / Very mild (5) / None(6)*	3.5	mild	3.1	moderate	*	3.2	moderate
During the past 4 weeks, how much energy did you have? *Response options: None (1) / A little (2) / Some (3) / Quite a lot (4) / Very much (5)*	2.9	some	2.8	some		2.8	some
During the past 4 weeks, how much did your physical health or emotional problems limit your usual social activities with family or friends? *Response options: Could not do social activities (1) / Quite a lot (2) / Somewhat (3) / Very little (4) / Not at all (5)*	3.1	somewhat	3.1	somewhat		2.8	somewhat
During the past 4 weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed, or irritable)? Response options: *Extremely (1) / Quite a lot (2) / Moderately (3) / Slightly (4) / Not at all (5)*	3.3	moderately	3.2	moderately		3.2	moderately
During the past 4 weeks, how much did personal or emotional problems keep you from doing your usual work, school or other daily activities? *Response options: Could not do daily activities (1) / Quite a lot (2) / Somewhat (3) / Very little (4) / Not at all (5)*	3.2	somewhat	3.3	somewhat		3.3	somewhat
Composite scale of SF-8™ current items (alpha=.87) for physical and mental health and functioning	3.1		3.1			3.1	

P-values reflect independent sample t-tests.   + *P* ≤ .10,   *P ≤ .05 ,   * *P* ≤ .01,   *** *P* ≤ .001

Table 34 shows generally comparable patient ratings of health between DSRIP CN and comparison sites.

Cost

Table 35. Cost-Related Outcomes: Descriptive Statistics

Emergency department use	DSRIP care navigation sites (N=168)		Comparison sites (N=269)			Combined (N=437)	
Question in patient telephone survey	Mean or % yes	Mean response/ Number yes	Mean or % yes	Mean response/ Number yes	P-value	Mean or % yes	Mean response/ Number yes
When was the last time you went to the emergency department for your own needs?					*** [across 4 categories]		
In the last 2 weeks	17%	28	23%	59		20%	87
Between 2 and 4 weeks ago	12%	19	20%	51		16%	70
Between 4 and 8 weeks ago	21%	34	23%	61		22%	95
More than 8 weeks ago	51%	84	34%	89		41%	173
Why did you go to the emergency department?							
Unintentional injury not related to illness	8%	14	9%	24		9%	38
Illness	35%	59	38%	101		37%	160
Pain	27%	46	32%	87		30%	133
Medication refills	2%	3	1%	3		1%	6
Other	27%	46	20%	54		23%	100
If this [reason patient last went to emergency department, excluding unintentional injuries] happened again, would you go to an emergency department again, that emergency department or any other?	90%	152	91%	245		91%	397

P-value reflects chi-square test.
+ *P* ≤ .10, * *P* ≤ .05, ** *P* ≤ .01, *** *P* ≤ .001

Approximately 40% of the patients surveyed by phone had been in the ED in the last month (Table 35). Among all 437 patients surveyed, 90% indicated that they would return to the ED the next time they experienced the event that had precipitated the last visit. Frequent reasons included the emergent nature of their health needs and perceiving the ED to be the fastest way to address those needs. The evaluation team used patients' self-reported disease conditions and treatment status, and insurance status from the patient phone survey, combined with Truven claims data from each service area, to estimate the average 2016 ED visit cost for the patients in this sample as $1,633. Table 18 shows statistically lower percentages of DSRIP CN patients been in the ED in the last 4 weeks than patients at comparison sites.

Table 36. Reasons Patients Reported for Planning to Return to the Emergency Department

Reasons patients report for returning to the emergency department	Illustrative quotes	Total N=396	
		N	%
Primary care physician availability			
No primary care provider	I would go because I don't have a PCP.	5	1
No primary care available at time of event	If I couldn't make the doctor's appointment within a reasonable time frame, I would go to the emergency department again as well.	29	7
Emergency department is faster	I would hurt and they would treat it right away.	68	17
Doctor's orders	I called my doctor first and they told me to go to the ER.	10	3
Emergency department preference			
Good care at emergency department	Because they gave me great service.	76	19
Preferred specific emergency department	I would go to another [different] emergency department because they [the first emergency department] don't take me seriously.	19	5
Health needs			
Emergency care	Because I need emergency treatment.	90	23
Pain	Because they can contain my pain.	26	7
Medications	They normally give me the medication I need	10	3
For information	I trust them in terms of explaining everything in a way I can understand it, the doctors and nurses explain that to me.	9	2
Take care of health needs	Because they help me out each time I go.	12	3
Financial			
No insurance/no means of paying for care	I don't have insurance to go the doctor and pay out of pocket.	7	2
Other	Well, where else would I go?	11	3
	Total	372	94

There were no significant differences between patients in DSRIP CN and comparison sites regarding reasons for returning to the Emergency Department.

Table 36 shows that the most frequently given reasons for returning to the ED were: 1) Need for emergency treatment (n=90), 2) Good care at the ED (n = 76), and 3) Convenience (quickness) of the ED (n=68).

DSRIP Care Navigation as a Predictor of Health Care Quality

Table 37. Multiple Regression Models of the Association Between Patient-Reported Receipt of DSRIP Care Navigation and Health Care Quality

	Quality outcomes					
	Information about treatment options logistic coefficient	p-value	Information about patient rights logistic coefficient	p-value	Able to refuse care or medication logistic coefficient	p-value
Key independent variable						
DSRIP care navigation	0.11		-0.11		-0.35	
Covariates						
Comorbidity index	0.15	**	0.06		0.06	
Comorbidity index-squared	-0.00	*	-0.00		-0.00	
Uninsured, relative to Medicaid	0.37		0.61		0.22	
Other insurance, relative to Medicaid	-0.14		0.37		-0.00	
Patient age	0.00		-0.03	*	-0.00	
Non-Hispanic Black	0.23		0.54		0.64	*
Non-Hispanic White	-0.18		0.66	+	0.70	+
High school education or more	0.44	+	0.11		0.62	*
CMHC-based project	-0.57		-1.03		-0.26	
EMS-based project	0.52		0.22		0.08	
N	431		431		431	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

Results in Table 37 reveal no associations between receipt of DSRIP CN and health care quality. Health care quality was operationalized as patients' self-reported knowledge of information about treatment options. The models that were identified as underpowered that also yielded null results for associations with receipt of CN were two measures of health care quality: (1) information about treatment options, and (2) information about patient rights.

However, qualitatively, study participants described care navigators helping patients and family members through health education, coaching, problem solving, and assistance for a variety of health care and non-health care needs.

> Patient at site Q: He and I watch my medications real close, and every time he comes he kind of discusses with me if I'm on any new medication, what kind of side effects I might have or—and that way he keeps knowledgeable on what I'm taking also….

Table 38. Multiple Regression Models of the Association Between Patient-Reported Receipt of Care Navigation and Health Care Quality

	Quality outcomes					
	Access to health care OLS coefficient	p-value	Agreement between providers logistic coefficient	p-value	Personal doctor up-to-date on care from other providers logistic coefficient	p-value
Key independent variable						
DSRIP care navigation	-0.16		-0.60		0.23	
Covariates						
Comorbidity index	0.02		-0.14	+	-0.02	
Comorbidity index-squared	0.00		0.00		-0.00	
Uninsured, relative to Medicaid	-0.08		0.36	***	0.75	
Other insurance, relative to Medicaid	0.02		0.10		0.40	
Patient age	0.01	**	0.02	+	0.03	+
Non-Hispanic Black	0.11		0.22		0.82	
Non-Hispanic White	-0.25	*	-0.49		-0.02	
High school education or more	-0.11		-0.27		0.76	+
CMHC-based project	0.10		omitted	NA	-0.54	
EMS-based project	-0.11		0.25		-0.61	
N	431		219		227	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P ≤ .10$, * $P ≤ .05$, ** $P ≤ .01$, *** $P ≤ .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

Regression models (Table 38) did not demonstrate impact of DSRIP CN on patient access to care or coordination among providers. The models that were identified as underpowered that also yielded null results for associations with receipt of care navigation were two measures of patient access to health care: (1) ease in getting tests, care, or treatment; and (2) ease in getting providers to agree on treatment plans. However, qualitatively, study participants described care navigators advocating on patients' behalf for health care services as well as non-health care services.

> Care navigator at site L: Part of the navigation was we assisted her with obtaining a pre-certification through her health insurance. The first time we sent it into her health insurance approved it but never sent a letter to the provider, never sent a letter to [local rehab hospital], never sent a letter to the patient. Then the authorization expired and then we had to start all over and then they couldn't tell me who they sent the letter to. They just said that they faxed it and they mailed the letter, although they have no documentation of it. Again, those are the kind of barriers that we have to face, so we got re-approved and then [local rehab hospital] did bring her in.

DSRIP CN facilitated services according to each patient's individual needs.

DSRIP Care Navigation as a Predictor of Health Status

Table 39. Multiple Regression Models of the Association Between Patient-Reported Receipt of Care Navigation and Patients' Physical and Mental Health

	Health outcomes			
	Physical health (SF-8™) OLS coefficient	p-value	Mental health (SF-8™) OLS coefficient	p-value
Key independent variable				
DSRIP care navigation	0.15		-1.42	
Covariates				
Comorbidity index	-1.90	***	-1.64	***
Comorbidity index-squared	0.05	***	0.02	+
Uninsured, relative to Medicaid	0.68		0.81	
Other insurance, relative to Medicaid	0.97		2.17	
Patient age	-0.02		0.03	
Non-Hispanic Black	-1.31		2.63	
Non-Hispanic White	-1.70		-0.13	
High school education or more	-0.09		0.20	
CMHC-based project	3.21		-1.03	
EMS-based project	-0.52		1.02	
N	406		431	

Note: EMS indicates emergency medical services; CMHC, community mental health center.

It is unclear how OptumInsight software dropped observations from these regressions, given that there was no item missing and no responses were out of range or mislabeled, which were the potential explanations provided by the software company. (Personal correspondence, Brian Baker, bbaker@qualitymetric.com, October 3, 2016) The algorithms used to generate the scales employed in the regression analyses are propriety, and hence not feasible to replicate.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

Despite the absence of significant association of DSRIP CN impact and patients' physical or mental health (Table 39), some patients reported reduced anxiety knowing that the care navigators were available to help them to identify the appropriate type of care, especially if patients were uncertain as to whether a health issue was serious enough to call 9-1-1 or go the emergency department.

> Family member at site R: For me, it's more of a peace-of-mind thing. It's like, okay, he doesn't feel well, something's wrong. It's like, okay, well, do I call 911? Was it really that necessary? It's like, okay, well, [the care navigator] is right here. He's five miles down the street. He can come over. I can call him and talk to him on the phone. … Like I said, more peace of mind that there's somebody right there just to talk to, that has the knowledge and the skills, that can say, "Oh, probably going to be all right. Just give him aspirin. Put him to bed for 20 minutes." Or it's like, "Yeah, we need to transport."

Patients and family members reported emotional support from DSRIP CN.

DSRIP Care Navigation as a Predictor of Costs

Table 40. Multiple Regression Models of the Association Between Patient-Reported Receipt of Care Navigation and Costs

	Cost outcomes			
	Visited ED in the last month logistic coefficient	p-value	Would go to ED again for the same issue logistic coefficient	p-value
Key independent variable				
DSRIP care navigation	-0.45		-0.21	
Covariates				
Comorbidity index	0.11	*	-0.00	
Comorbidity index-squared	-0.00		-0.00	
Uninsured, relative to Medicaid	-0.56	+	1.30	*
Other insurance, relative to Medicaid	-0.72	**	-0.19	
Patient age	-0.01		-0.02	
Non-Hispanic Black	0.47	+	0.79	
Non-Hispanic White	0.62	*	0.13	
High school education or more	-0.35		-0.25	
CMHC-based project	1.01	+	-0.77	
EMS-based project	-0.15		-0.06	
N	419		394	

Note: EMS indicates emergency medical services; CMHC, community mental health center.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$ Only statistically significant key independent variables are explained, as covariates were included only to reduce omitted variable bias (confounding) in coefficients for the key independent variables.

Although the multiple regression models shown in Table 40 did not find receipt of DSRIP CN to be associated on average with reduced ED use, care navigators, as well as patients, sometimes reported changes in health care utilization can reduce costs to taxpayers in the future once process changes lead to outcome improvements.

> Patient at site N: I went to the [FQHC] when I broke out in this, instead of going to the ER, because they did tell me about the [FQHC] . . . They did recommend the [FQHC] and because I could get a ride and stuff, I chose to go that route instead of go back to the ER.

Hospital Encounters

During the course of the study, the evaluation team discovered from sites a high frequency of hospitalizations amongst patients receiving DSRIP CN. While the initial focus of DSRIP CN projects was ED utilization, the evaluation team also pursued the use of hospital discharge data. Some studies have found CN associated with reduced hospital use (Corbett et al., 2005; Enard & Ganelin, 2013; Okin et al., 2000; Shumway, Boccellari, O'Brien, & Okin, 2008). However, other research has shown no association between CN and hospitalizations (Block et al., 2013; Gardner et al., 2014; Hegney et al., 2006; Horwitz, Busch, Balestracci, Ellingson, & Rawlings, 2005; Kim et al., 2013; Lee & Davenport, 2006; Peikes et al., 2009; Sin et al., 2004; Spillane et al., 1997; Wong et al., 2004). Due to the similar nature between CN and ED visits and CN and hospitalizations, the evaluation team included analyses related to CN and hospitalizations to better understand DSRIP CN projects.

Data from the Texas Health Care Information Collection (THCIC) was analyzed to test for associations between DSRIP CN and hospital use. For these analyses, two DSRIP CN sites sent pre-care navigation data for six months before the first patient enrolled in CN, and at least 6 months of post-care navigation data for all patients who received these services, covering the period January 1, 2013, through the end of June 2016. In addition, two comparison sites sent rosters of patients who had visited the ED 5 or more times during the calendar year 2015 (1/1/2015 – 12/31/2015), including information about those patients' hospital encounters during the 18-month period 1/1/2015 – 6/30/2016. The research team combined these patient identifiers into a single roster, which the Texas Department of State Health Services used to pull THCIC hospital discharge data for 1/1/2013 – 12/31/2015. The difference between the time periods of the hospital rosters and THCIC data mean that any patients whose care navigation began in 2016 were omitted from these analyses. Below, Table 41 descriptively profiles the patients whose THCIC data were used for the current analyses.

Table 41. Demographic Data for Patients with a Hospital Encounter during Study Period

Characteristic	DSRIP CN 1 (n=773)	Comparison 1 (n=464)	DSRIP CN 2 (n=1,220)	Comparison 2 (n=1,792)	Overall (n=4,249)
Sex, n (%)					
Male	466 (60)	203 (44)	570 (47)	576 (32)	1,815 (43)
Female	307 (40)	261 (56)	650 (53)	1,216 (68)	2,434 (57)
Age, yrs (range) mean ± SD	(19 to 95) 50 ± 13	(18 to 95) 54 ±17	(19 to 94) 58 ± 14	(18 to 101) 49 ± 22	(18 to 101) 53 ± 18
Race, n (%)					
White	202 (26)	294 (63)	828 (68)	1,182 (66)	2,506 (59)
Non-White	571 (74)	170 (37)	392 (32)	610 (34)	1,743 (41)
Ethnicity, n (%)					
Hispanic	203 (26)	75 (16)	1,068 (88)	1,431 (80)	2,777 (65)
Non-Hispanic	570 (74)	389 (84)	152 (12)	361 (20)	1,472 (35)

Abbreviations: CN is care navigation; SD, standard deviation.

The modal patient in the THCIC data from these four facilities was in her fifties. Overall, there were White and Hispanic majorities in the racial and ethnic compositions of the patients.

Below is the health insurance profile for patients in the THCIC discharge data used for these analyses. Data on patient health insurance status, shown in Table 42, were drawn from primary and secondary payer fields within the THCIC data. When more than one payer source appeared in a patient's record, Medicare was coded to override private insurance, on the basis that the private coverage was likely to be supplemental. Medicaid was coded to override Medicare, as this was considered an indicator of dual eligibility; patients with dual eligibility tend to have very low incomes, making these individuals in that respect generally more similar to the Medicaid than the Medicare population. Charity care, indigent, THCIC/uninsured, and self-pay were all categorized as uninsured. The final category, "Other insured" includes all categories of private insurance or similar coverage, e.g., Aetna, non-Medicaid Amerigroup, Blue Cross Blue Shield of Texas, and CHAMPUS.

Table 42. Insurance Status for Patients with a Hospital Encounter During Study Period

Insurance status n (%)	DSRIP CN 1 (n=773)	Comparison 1 (n=464)	DSRIP CN 2 (n=1,220)	Comparison 2 (n=1,792)	Overall (n=4,249)
Uninsured	385 (50)	84 (18)	1,137 (93)	279 (16)	1,885 (44)
Insured					
Medicaid	59 (8)	30 (6)	18 (1)	204 (11)	311 (7)
Medicare	96 (12)	183 (39)	36 (3)	619 (35)	934 (22)
Other insured	233 (30)	167 (36)	29 (2)	690 (39)	1,119 (26)

Abbreviations: CN is care navigation.

Reflecting the focus of the waiver, 51% of patients were either insured through Medicaid or were uninsured.

The best proxy available in discharge data for patients' severity of illness is the 3M™ All Patient Refined Diagnosis Related Groups (APR-DRG). Unlike previous patient classification systems that used only facility resources needed to treat different categories of patients, the APR-DRG adjusts disease-specific diagnostic groups by patient age, four levels of illness severity, and four levels of mortality risk. The four Diagnosis Related Group levels (Lyons, 2012), with examples from diabetes, are:

> Level 1: Minor. Example: Uncomplicated Diabetes
>
> Level 2: Moderate. Example: Diabetes with Renal Manifestation
>
> Level 3: Major. Example: Diabetes with Ketoacidosis
>
> Level 4: Extreme. Example: Diabetes with Hyperosmolar Coma

3M™ APR-DRGs are widely used for risk adjustment by providers, payers, and for public reporting (Goldfield, 2010). Below in Table 43, the descriptive statistics show the levels of medical severity associated with hospital encounters for patients receiving CN. The statistics shown are from the year before each patient began receiving CN as an indication of patients' baseline hospital-related severity.

Table 43. Patients' 3M™ All Refined Diagnosis Related Groups Levels

Baseline 3M™ APR-DRG Level, n (%)	DSRIP CN 1 (n=773)	Comparison 1 (n=464)	DSRIP CN 2 (n=1,220)	Comparison 2 (n=1,792)	Overall (n=4,249)
Level 1 (Minor)	187 (24)	83 (18)	183 (15)	568 (32)	1,021 (24)
Level 2 (Moderate)	363 (47)	219 (47)	559 (46)	706 (39)	1,847 (43)
Level 3 (Major)	169 (22)	138 (30)	388 (32)	414 (23)	1,109 (26)
Level 4 (Extreme)	54 (7)	24 (5)	90 (7)	104 (6)	272 (6)

Abbreviations: 3M™ APR-DRG is All Patients Refined Diagnosis Related Groups; CN, care navigation.

Consistent with previous research (Shen, 2003), among patients receiving CN for whom discharge data were available, most hospital encounters were for minor to moderate severity.

In order to compare hospital encounters before and after patients received DSRIP CN services, we measured hospital encounters in the year just before each patient began receiving CN and during the first year after receiving CN services. Each patient at a DSRIP CN site was coded as

receiving CN beginning on the date of first CN service by that site. Each patient's most recent hospital encounter within the year prior to the first CN service was used to indicate pre-CN hospital use. The first hospital encounter after at least 30 days of receiving CN was used to measure hospital use after receiving CN. The 31 day minimum duration of CN was used to allow these services time to affect patient need for emergent care. The distribution of start dates in each DSRIP CN site was then replicated in its comparison site for the patients at that site.

Table 44 below shows descriptively patterns of hospital encounters and lengths of stay for the patients in the THCIC discharge data analyses.

Table 44. Hospital Encounters and Length of Stay During Study Period

Characteristic	DSRIP CN 1 (n=773)	Comparison 1 (n=464)	DSRIP CN 2 (n=1,220)	Comparison 2 (n=1,792)	Overall (n=4,249)	P-value for difference
Hospital encounters, mean ± SD						***
During year pre-CN	3.04 ± 3.19	3.03 ± 3.39	1.60 ± 1.44	1.37 ± 1.68	1.92 ± 2.33	
During 1st year	1.21 ± 2.27	1.91 ± 2.41	.62 ± 1.56	1.75 ± 2.21	1.35 ± 2.14	
Length of stay, mean ± SD						***
During year pre-CN	6.01 ± 7.01	5.95 ± 6.12	5.56 ± 5.12	5.89 ± 10.98	5.81 ± 7.99	
During 1st year	6.73 ± 9.34	5.39 ± 5.79	4.73 ± 4.17	4.77 ± 5.92	5.16 ± 6.38	

Abbreviations: CN is care navigation.
+ $P \le .10$, * $P \le .05$, ** $P \le .01$, *** $P \le .001$

Descriptive statistics indicated that both hospital encounters and length of stay were lower for patients receiving CN than for patients at non-DSRIP CN sites on average (two sample t-test p-value ≤ .001).

We used a two-stage process to test the associations between receiving CN and (1) the probability of having a hospital encounter during the first year of CN; and (2) for patients who had a hospital encounter, the length of stay (Wooldridge, 2003). The distribution of hospital encounters was heavily skewed, and were therefore dichotomized for the regression.

A logit regression was used to test associations between patients' receipt of DSRIP CN and annual probability of a hospital encounter (Table 45).

Table 45. Logit Regression Predicting Hospital Encounters in 1st Year after Receiving CN (n = 4,247)

	Hospital encounters in 1st year after receiving CN	
	Coefficient	P-value
Key independent variable		
Receipt of CN	-0.94	***
Covariates		
3M™ APR-DRG Level (severity of illness and risk of mortality)		
Level 1 (Minor)	-0.27	**
Level 3 (Major)	0.14	
Level 4 (Extreme)	-0.06	
Sex (male)	0.18	*
Age	0.00	*
Race—Non-White	0.22	**
Ethnicity—Hispanic	-0.17	*
Insurance		
Medicaid	0.84	***
Medicare	1.10	***
Other insurance	0.73	***
Period (Quarter & Year CN started - 2013Q4)		
2014Q1	-0.23	
2014Q2	-0.28	
2014Q3	-0.28	
2014Q4	-0.42	+
2015Q1	-0.82	**
2015Q2	-0.90	***
2015Q3	-1.49	***
2015Q4	-3.02	***

Abbreviations: *3M™* APR-DRG is All Patients Refined Diagnosis Related Groups; CN,care navigation. *3M™* APR-DRG levels correspond to a patient's illness severity and risk of mortality: Level 1 = minor severity of illness and risk of mortality; Level 2 = moderate severity of illness and risk of mortality; Level 3 = major severity of illness and risk of mortality; Level 4 = extreme severity of illness and risk of mortality.;
$+ P \le .10$, $* P \le .05$, $** P \le .01$, $*** P \le .001$

The probability of hospital encounters decreased by 19 percentage points in the first year after beginning CN (P < .001). Because the initial probability of a hospital encounter (expressed as a percentage) is compared to a second probability (also expressed as a percentage), that decrease in probability of a hospital encounter is reported as a decrease by the number of percentage points (Wooldridge, 2003, pp. 681-682). Length of stay was modeled using ordinary least squares regression, with this outcome log-transformed to reduce skew in its distribution (Manning & Mullahy, 2001). These models included only patients who had a hospital encounter

after CN had begun for patients at the DSRIP CN sites. Hence, the sample for this model is smaller than the sample for the model predicting any hospital encounters.

Table 46.Ordinary Least Squares Regression Predicting Length of Stay in 1st Year after Receiving CN (n = 2,268)

	Length of stay in 1st year after receiving CN	
	Coefficient	P-value
Key independent variable		
Receipt of CN	0.02	
Covariates		
3M™ APR-DRG Level (severity of illness and risk of mortality)		
Level 2 (Moderate)	-0.21	***
Level 3 (Major)	0.26	***
Level 4 (Extreme)	0.96	***
Sex (male)	0.07	*
Age	0.00	**
Race—Non-White	-0.09	**
Ethnicity—Hispanic	-0.15	***
Insurance		
Medicaid	0.17	**
Medicare	-0.01	
Other insurance	-0.06	
Period (Quarter & Year CN started - 2013Q4)		
2014Q1	-0.07	
2014Q2	0.09	
2014Q3	0.03	
2014Q4	0.07	
2015Q1	0.06	
2015Q2	0.04	
2015Q3	0.08	
2015Q4	-0.06	

Abbreviations: 3M™ APR-DRG is All Patients Refined Diagnosis Related Groups; CN, care navigation. 3M™ APR-DRG levels correspond to a patient's illness severity and risk of mortality: Level 1 = minor severity of illness and risk of mortality; Level 2 = moderate severity of illness and risk of mortality; Level 3 = major severity of illness and risk of mortality; Level 4 = extreme severity of illness and risk of mortality.;
$+ P \le .10$, $* P \le .05$, $** P \le .01$, $*** P \le .001$

Results from the multiple regression model shown in Table 46 above indicate that DSRIP-funded CN was not associated with length of stay.

CONCLUSION

OVERVIEW OF RESULTS:

Context

- CN is multifaceted with Navigators performing various roles and covering various topics (e.g., education, referrals, advocates, follow-up)
- Rural settings can inhibit CN due to resource limitations
- Rural settings small social networks are both a positive and negative when meeting people's health needs
- Profound contrasts exist in how CN is administered based on provider infrastructures
- CN role clarity had a higher probability patients reported they had information about the different kinds of education or treatment available to them
- Patients who utilized personal health records with different providers perceived higher access to health care
- Utilization of personal health records by patients to track/manage their health care had a lower probability of having been in the ED in the previous month

Processes

- Patients who reported understanding the purpose of each of their medications had a higher probability of reporting they had information about the different kinds of education or treatment that were available
- Patients who reported using a personal health record to track/manage their health care had a higher probability of reporting they had information about the different kinds of education or treatment that were available
- Patients who reported having as much information as they wanted about what they could do to manage their condition had a higher probability of reporting they had information about the different kinds of education or treatment that were available
- Patients who received CN at home had a lower probability of understanding their treatment options
- Patients who had higher perceptions of getting quality care from their care navigators had a higher probability of reporting they had information about the different kinds of education or treatment that were available
- Patients who had plans developed by care navigators had a higher probability of reporting they had information about the different kinds of education or treatment available
- Patients where care navigator's occasionally provided transport to appointments had a higher probability of reporting they had information about the different kinds of education or treatment available
- Patients who reported having as much information as they wanted about what they could do to manage their condition had a higher probability of reporting providers agree with each other on the best way to manage the patient's health condition
- Patients' perception of coordination quality from their care navigators was associated with increased perceived access

- Patients who had high perceptions of the care they received from the care navigators had a higher probability of reporting their providers agreed with each other on the best way to manage the patient's health condition
- Patients who developed care plans with their care navigator had a higher probability of reporting that providers were always informed and up-to-date about care received from other doctors
- Each month of CN provided by a DSRIP CN project was associated with a higher probability that patients would report agreement between their providers
- When care navigators spoke with ED staff regarding patients, then patients had a lower probability of reporting their providers agreed with each other on the best way to manage the patient's health condition

Outcomes

- Of surveyed patients, 90% indicated they would return to the ED because of the perceived emergent nature of their condition
- Estimated average ED visit in 2016 cost approximately $1,633
- Patients receiving CN had minor to moderate health severity
- Hospital encounters decreased after the first year of CN

The purpose of this part of the Demonstration evaluation was to determine whether DSRIP CN affected health care quality, population health, and costs ("Triple Aim"). As usual with assessments of complex innovations, the results were mixed. Regression analyses did not show differences between CN DSRIP sites and the comparison sites. However, this does not mean that DSRIP CN had no effects on Triple Aim outcomes. For instance, hospital encounters for CN participants at two sites decreased after receiving DSRIP CN, and additional regression analyses indicate that a range of process and context factors may improve future outcomes after sustained project implementation affects patients' long-term approaches to preventive care and dealing with chronic and complex diseases. These findings are supported by perspectives shared by providers, patients, and family members in interviews and focus groups. Study participants described DSRIP CN as providing emotional, advocacy, informational, and tangible support. Care navigators also acted as advocates and liaisons with health care providers and for related non-health care services. Care navigators provided informational support through educating, coaching, and providing guidance and assistance to patients and family members. Finally, care navigators helped patients receive medical supplies and equipment, groceries, clothes, and government documents necessary for qualified individuals to secure health coverage.

There are a few likely reasons why overall quality, population health, and costs did not differ in the areas measured between patients receiving DSRIP CN and comparable patients at comparison sites. On the one hand, providers throughout Texas are experimenting with a range of resources intended to shift care toward more preventive, comprehensive health care settings than ED. Paradoxically, another likely reason for the absence of overall regression effects is that DSRIP CN is, on average, a low "dosage" intervention, with patient-reported averages of two phone calls and no home visits. However, both quantitative and qualitative data suggest that the DSRIP CN projects included in this study may require more time for detectable impacts on

patient outcomes. This likely reflects the magnitude of patient needs and the time required for changes in patient care use and health self-management to manifest in measurable changes in disease conditions.

STRENGTHS AND LIMITATIONS

Study limitations included the inability to control for the myriad concurrent factors also affecting patient health care quality, population health, and cost-related outcomes. Also, even though the evaluation team scrupulously incorporated potentially relevant additional organizational resources (such as EHRs) and services (such as planning with patients), additional relevant factors may have been omitted.

The DSRIP CN evaluation utilized a comparative case study to disentangle the causal complexity of DSRIP projects' impact on patient outcomes, and control for the non-randomness of DSRIP program. The projects and their concurrent comparisons were sampled to represent all major regions of Texas, and different provider types, as well as project emphases—such as improving coordination to improve prevention—that are common in the Demonstration. However, results from the current evaluation may not generalize to other DSRIP projects.

A second study limitation was the limited sample size for the regression analyses. The patient phone survey samples were constrained by the numbers of people receiving DSRIP CN in the 10 study sites, and the proportion of people contacted who participated. The sample size also limited statistical power for some of the models employed. Because for both privacy and feasibility reasons patient phone survey data were not merged with administrative data, it was also not possible to cross-check patient reports of health conditions and service use. Finally, the hospital discharge analysis was limited to two case and two comparison sites.

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APPENDIX F: EFFECTS ON UNCOMPENSATED CARE (UC)

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BACKGROUND ON UNCOMPENSATED CARE COSTS

As noted in the Executive Summary, the most immediate impact of the Demonstration on Uncompensated Care (UC) cost was the change in the mechanism used to determine provider payments for UC. The Demonstration created two new funding pools: The UC pool and the Delivery System Reform Incentive Payment (DSRIP) pool. The UC pool replaced the existing Upper Payment Limit (UPL) program as a mechanism to reimburse providers for the costs of providing care to Medicaid patients and the uninsured population net of payments received for care provided to Medicaid and uninsured patients. The Demonstration also created the DSRIP pool, a new pool to provide payments to providers for successful achievement of performance benchmarks for a range of projects intended to improve the local delivery of health care. In contrast to reimbursements from the UC pool, DSRIP payments are not direct reimbursement for expenditures or payments for services, and as such do not affect the level of reimbursement a hospital may receive through the UC pool. The non-federal share of UC and DSRIP payments is funded through intergovernmental transfers (IGTs). These IGTs are public matching funds used to draw down the federal share.

The Demonstration also expanded Medicaid managed care (MMC) to new service delivery areas and carved pharmacy and non-behavioral health inpatient services into managed care, which were previously covered through a traditional fee-for-service (FFS) payment system. If MMC improves the management of health services utilization, it may result in lower cost in addition to better health care quality and outcomes. If so, UC in the form of Medicaid shortfalls should decrease as the share of Medicaid enrollees in managed care increases. Also, even without an expansion of eligibility criteria, the mandate for insurance coverage under ACA may increase Medicaid enrollment. However, the impact of any resulting changes in Medicaid enrollment on hospital's UC costs may be muted given existing provisions for retroactive enrollment of Medicaid-eligible patients who are hospitalized.

The most obvious and far-ranging changes potentially affecting UC cost occurring contemporaneous to DSRIP-program implementation are associated with the ongoing phased implementation of ACA. One goal of ACA is to reduce the number of individuals without health insurance. Accordingly, ACA as originally enacted included planned reductions in aggregate DSH payments over time, ranging from a nationwide reduction of $500 million in Federal Fiscal Year (FFY) 2014 to $3 billion in FFY2020 (Kaiser Family Foundation, 2013). However, the Medicare Access and CHIP Reauthorization Act of 2015 delayed the implementation of planned DSH payment cuts under ACA until FFY2018, and revised the magnitude and duration of the payment reductions, now specified as $2 billion in FFY2018, $3 billion in FFY2019, $4 billion in FFY2020, $5 billion in FFY2021, $6 billion in FFY2022, $7 billion in FFY2023, and $8 billion each in FFY2024-2025. Past studies assessing the impact of reductions in DSH payments on the provision of care to the uninsured conclude that lowering DSH payments induced hospitals providing substantial UC to reduce their provision of UC, but had little impact on hospitals providing modest levels of UC, resulting a modest effect overall (Lo Sasso & Seamster 2007; Bazzoli, et al. 2006; Hsieh & Bazzoli 2012).

Table 1. Key Terms and Definitions

Key Terms	Definition
Medicaid shortfall	Unreimbursed costs (the excess of costs over payments) from patient care services provided to Medicaid enrollees
Uninsured shortfall	Unreimbursed costs from patient care services provided to uninsured persons
Physician/Mid-level/Pharmacy Costs	UC costs related to physician & mid-level costs at a hospital, and pharmacy services for reimbursement from the UC pool
Uncompensated Care (UC) Cost	The total of Medicaid shortfall, uninsured shortfall, and unreimbursed costs related to hospital-affiliated physician, mid-level, and pharmacy costs
Disproportionate Share Hospital/ Uncompensated Care (DSH/UC) application data	Attachment H to the STCs entitled "UC Claiming Protocol and Application" establishes the process for obtaining information from hospitals and calculating unreimbursed costs for Medicaid and uninsured patients. Texas HHSC uses this DSH/UC application to collect data to calculated uncompensated care. The data collected through this process and calculated data from these data are the main source of UC cost data in this report.
Uncompensated Care (UC) Payment Pool	Under the Demonstration, a supplemental payment pool for reimbursement for UC costs incurred by providers based on the level of eligible UC cost reported in the annual DSH/UC application (see TSLDU)
Delivery System Reform Incentive Payment (DSRIP) pool	Under the Demonstration, an incentive payment pool for hospitals and other providers to transform their service delivery practices to improve quality, health status, patient experience, coordination, and cost-effectiveness.
Upper Payment Limits (UPL) system	The supplemental payment system for reimbursement for eligible UC costs incurred by providers prior to the Demonstration. It was replaced by the UC Payment Pool during the Demonstration.
Disproportionate Share Hospital (DSH) payments	DSH payments are federal supplemental payments made to qualifying hospitals that serve a large number of Medicaid and uninsured patients to partially offset UC costs
Intergovernmental transfers (IGTs)	Local public matching funds that are the source of the state match that is required to receive the federal share for both UC and DSRIP payments
Total shortfall less DSH payments (TSLD)	UC Cost remaining after DSH payments received; also known as unreimbursed costs.
Total shortfall less DSH and UC payments (TSLDU)	UC Cost remaining after DSH and UC payments received.
Consumer Price Index (CPI)	The CPI is a statistical estimate constructed using the prices of a sample of representative items whose prices are collected periodically to measures changes in the price level
Regional Healthcare Partnerships (RHP)	Locally-developed confederations. The RHPs serve as a mechanism to plan, implement, and track DSRIP projects and UC payments.

DSRIP TIMELINE
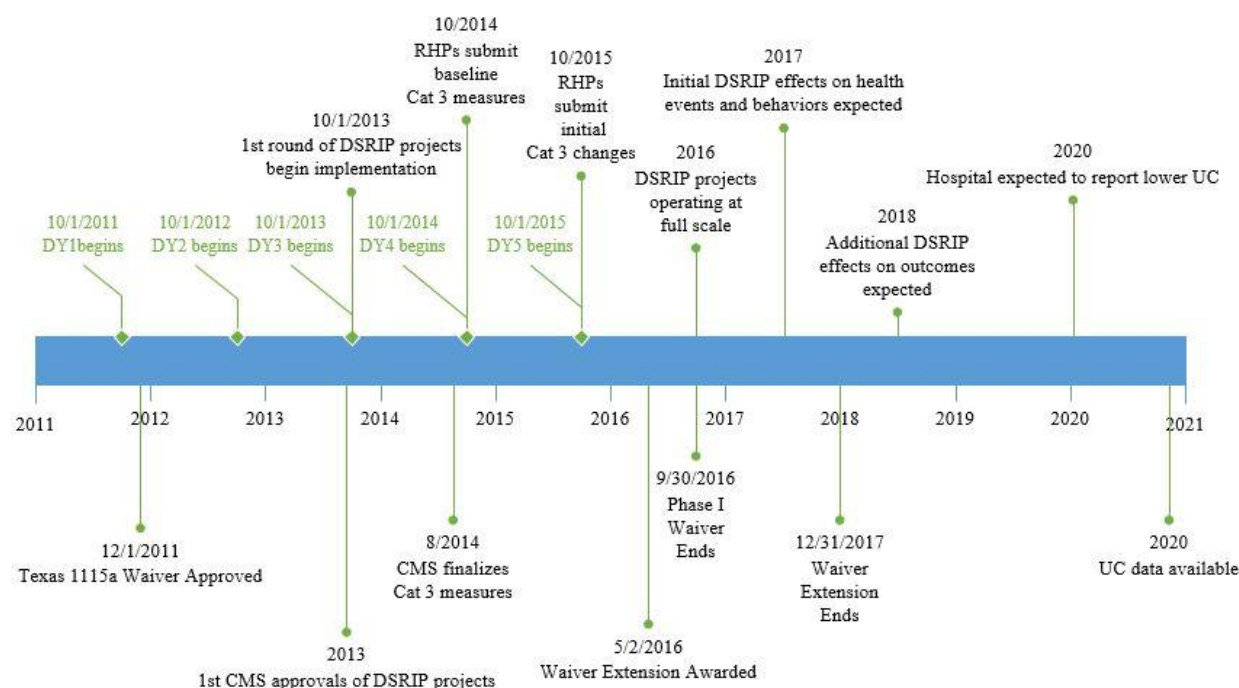
Figure 1. DSRIP Project Timeline

Source: HHSC, 2015b

The first demonstration year (DY1) started on 10/1/2011; however, the first round of DSRIP projects began in DY3 (10/1/2013-09/30/2014), after the projects received approval from CMS in mid-2013 (see Figure 1). Due to the complexity of the projects and need for staffing and intra- and inter-organizational coordination, relatively few patients were affected until DY4. As a result of the data lag, at the time of this final report, the UC cost data available were for only FY2013 (see Figure 1 and Table 2 below for details). This was before the implementation of the first round of DSRIP projects. Therefore, the capability of this study to examine the effect of DSRIP projects was limited, and further follow-up studies at a later time will be necessary.

EVALUATION GOALS

Evaluation Goal 5: Evaluate whether the two new funding pools, UC and DSRIP payment pools, were effective in assisting Texas hospitals with their UC costs, and assess whether any changes in UC costs were attributable to the DSRIP Demonstration interventions.

EVALUATION DESIGN

In this appendix, we conduct a detailed analysis of the UC cost trends in Texas beyond the state level analysis presented in the Executive Summary, which uses the full sample of 353 hospitals that reported at least one year of UC cost between FY2010 and FY2013. In contrast, the analysis reported in this appendix consists of subgroup analysis for different types of hospitals

conducted using only the 263 hospitals that reported UC cost in all 4 years so that we have comparable subgroup samples. The trend analysis also includes sensitivity analysis on (1) the comparison of the constant dollar to nominal dollars and (2) the comparison between the full list of hospitals (N=353) and those with UC in all years (N=263). We further follow this by a projection analysis that project the data from the 263 hospitals with all 4 years of data to the full sample of 353 hospitals under the assumption there is full participation. The third analysis presents the methodology developed for the hypothetical inferential analysis that would study the effects of DSRIP projects on UC costs when data become available. As discussed in the data sources section below, currently the data required for this inferential analysis is not available so no results are presented in this report. Instead, we share some simple descriptive analysis on the UC Payment Pool and the DSRIP Payment Pool and how they relate. Finally, we conclude with an analysis of the stakeholder perception of the changes in UC payment.

DATA SOURCES

The UC data used in this report were primarily obtained from the Disproportionate Share Hospital/Uncompensated Care (DSH/UC) application and calculated for 2010 to 2013 covering UC costs incurred in 2010 to 2013. We also obtained data from the American Hospital Association (AHA) annual survey data from 2010 to 2015, as well as the publically available Delivery System Reform Incentive Payment (DSRIP) program data file from 2013 to 2015 (HHSC, 2016b).

The DSH/UC application data and the calculated values from these data elements were obtained from HHSC as the main data used for descriptive analysis. The first year of UC payment was based on the reported costs that occurred between October 1, 2009 and September 30, 2010 as an estimate of UC costs in the 2012 DSH/UC application. Similarly, each subsequent year's payment was based on a 2-year lag cost. This data lag is a result of hospitals' need for time to reconcile and finalize their financial data (see Table 2). For this report, the most recent available data were reported in 2015 and covered the costs in fiscal year 2013. As the first round of DSRIP project implementation started on October 1, 2013, all available data depicts the situation before the DSRIP implementation (see Table 2).

Table 2. Timing of Availability of Uncompensated Care Cost and Payment Data

UC/UPL Data to HHSC	Payment Period between		Payment Data for Program	Reflecting Costs Incurred between		Cost Data for Program	Notes	Data Availability
UPL 2011	10/1/2010	9/30/2011		10/1/2008	9/30/2009			
UC 2012	10/1/2011	9/30/2012	DY 1	10/1/2009	9/30/2010			Data available for final report
UC 2013	10/1/2012	9/30/2013	DY 2	10/1/2010	9/30/2011			
UC 2014	10/1/2013	9/30/2014	DY 3	10/1/2011	9/30/2012	DY 1		
UC 2015	10/1/2014	9/30/2015	DY 4	10/1/2012	9/30/2013	DY 2		
UC 2016	10/1/2015	9/30/2016	DY 5	10/1/2013	9/30/2014	DY 3	DSRIP projects operational	Data unavailable during Demonstration
UC 2017	10/1/2016	9/30/2017		10/1/2014	9/30/2015	DY 4		
UC 2018	10/1/2017	9/30/2018		10/1/2015	9/30/2016	DY 5		

DSRIP indicates Delivery System Reform Incentive Payment; DY, Demonstration Year; HHSC, Texas Health and Human Services Commission; UC, Uncompensated Care; UPL, Upper Payment Limit.

More specifically, hospitals report the extent of charges and any payments received for services provided to the uninsured. After the reported charges are converted to estimated costs, the difference between payments and costs for services provided to the uninsured is defined as the uninsured shortfall. Similarly, reported charges for services provided to the Medicaid patients are converted to estimated costs, and the difference between Medicaid payments received and costs is defined as the Medicaid shortfall. In addition to the estimate of UC relating to hospital services, the hospitals were allowed to include UC costs related to hospital-affiliated physician, mid-level costs, and pharmacy services for reimbursement from the UC pool. Subtracting from this total any payments received by providers under the Disproportionate Share Hospital (DSH) program yielded the hospital's total unreimbursed costs, which was the basis for the UC payment. Both cost and payment items were separately adjusted by Consumer Price Index (CPI) into constant dollars.

Table 3. DSRIP Project Categories

Category	Project Area	Project Area Description
Primary Care	2.4	Redesign to Improve Patient Experience
Primary Care	1.1	Expand Primary Care Capacity
Primary Care	1.2	Increase Training of Primary Care Workforce
Primary Care	2.3	Redesign Primary Care
Behavioral Health	2.15	Integrate Primary and Behavioral Health Care services
Behavioral Health	1.11	Implement technology-assisted services to support, coordinate, or deliver behavioral health services
Behavioral Health	1.12	Enhance service availability (i.e., hours, locations, transportation, mobile clinics) of appropriate levels of behavioral health care
Behavioral Health	1.13	Development of behavioral health crisis stabilization services as alternatives to hospitalization
Behavioral Health	1.14	Develop workforce enhancement initiatives to support access to behavioral health providers in underserved markets and areas (e.g., psychiatrists, psychologists, LMSW, LPC, and LMFTs)
Behavioral Health	2.13	Provide an intervention for a targeted behavioral health population to prevent unnecessary use of services in a specified setting
Behavioral Health	2.16	Provide virtual psychiatric and clinical guidance to all participating primary care providers delivering services to behavioral patients regionally.
Behavioral Health	2.17	Establish improvements in care transitions from the inpatient setting for individuals with mental health and/or substance abuse disorders
Behavioral Health	2.18	Recruit, train, and support consumers of mental health services to provide peer support services
Behavioral Health	2.19	Develop care management functions that integrates primary and behavioral health needs of individuals
Specialty Care	1.8	Increase, Expand, and Enhance Oral Health Services
Specialty Care	1.9	Expand Specialty Care Capacity
Specialty Care	2.10	Use of Palliative Care Program
Access to Care	1.4	Enhance Interpretation Services and Culturally Competent Care
Access to Care	1.5	Collect Valid and Reliable Race, Ethnicity, and Language (REAL) data to reduce disparities
Access to Care	1.6	Enhance Urgent Medical Advice
Access to Care	1.7	Introduce, Expand, or Enhance Telemedicine/Telehealth
Care Navigation	2.1	Enhance/expand Medical Homes
Care Navigation	2.12	Implement/Expand Care Transitions Programs
Care Navigation	2.2	Expand Chronic Care Management Models

Care Navigation	2.9	Establish/Expand a Patient Care Navigation Program
Chronic Disease Management	1.3	Implement a Chronic Disease Management Registry
Chronic Disease Management	2.11	Conduct Medication Management
Chronic Disease Management	2.14	Implement person-centered wellness self-management strategies and self-directed financing models that empower consumers to take charge of their own health care.
Prevention/Wellness	2.6	Implement Evidence-based Health Promotion Plans
Prevention/Wellness	2.7	Implement Evidence-based Disease Prevention Programs
Other	1.10	Enhance Performance Improvement and Reporting Capacity
Other	2.5	Redesign for Cost Containment
Other	2.8	Apply process Improvement methodology to Improve Quality/Efficiency

The AHA survey data provided detailed information about hospital characteristics for the analysis of this evaluation goal. Information about the number of set-up and staffed beds from AHA was used to determine the relative sizes of hospitals. Details about control types (i.e., who manages the hospital) were also used as reference in categorizing hospitals into subgroups.

The DSRIP payment information was obtained from the DSRIP program data file (HHSC, 2016b). It provided the amount paid to each hospital in every year since the beginning of DSRIP program. At the time of this final report, data for DSRIP were completely available from DY2 (fiscal year 2013) to DY4 (fiscal year 2015) and partially available for DY5 (fiscal year 2016). We used only the full data through DY4. Two important variables retrieved from this dataset were project area used to categorize projects (see Table 3) and DSRIP payment amounts.

TREND ANALYSIS: COST DATA FROM 2010 TO 2013

The main components of reported cost items are the Medicaid shortfall, the uninsured shortfall and uncompensated costs for hospital, physician, and pharmacy services. The sum of those three items is total shortfall or total UC costs. We then subtract UC Pool payments and DSH payments from the total UC costs to obtain the total shortfall less DSH and UC payments (TSLDU). Finally, percentages of UC pool payments covering total shortfall less DSH payments (TSLD) were analyzed in response to the STC question "What percentage of providers' uncompensated care cost was made up by payments from the UC Pool?".

Subgroup analyses were conducted for hospitals that reported positive UC for all 4 years (N=263), with four categorization methods: Hospital control type, RHP tier, RUCC classification status, and Rider 38 status. These analyses were conducted in order to investigate differences of UC costs and payments in hospitals with different characteristics. To account for differences in hospital sizes for these subgroup analyses, hospital number of staffed beds were obtained from AHA survey data and used to scale all cost and payment items to per bed.

Hospital Control Type

Hospital control type refers to which entity is managing the hospital, which may be different than ownership type. The hospitals that reported positive UC for all 4 years were categorized as one of three control types based on 2015 AHA control type: Public (N=103), private for-profit (N=106), and private non-profit (N=54). Two hospitals that were private for-profit in 2012 became private non-profit in 2013 and 2014 respectively, resulting in a total of 106 private non-profit hospitals in 2015 (Figure 2).
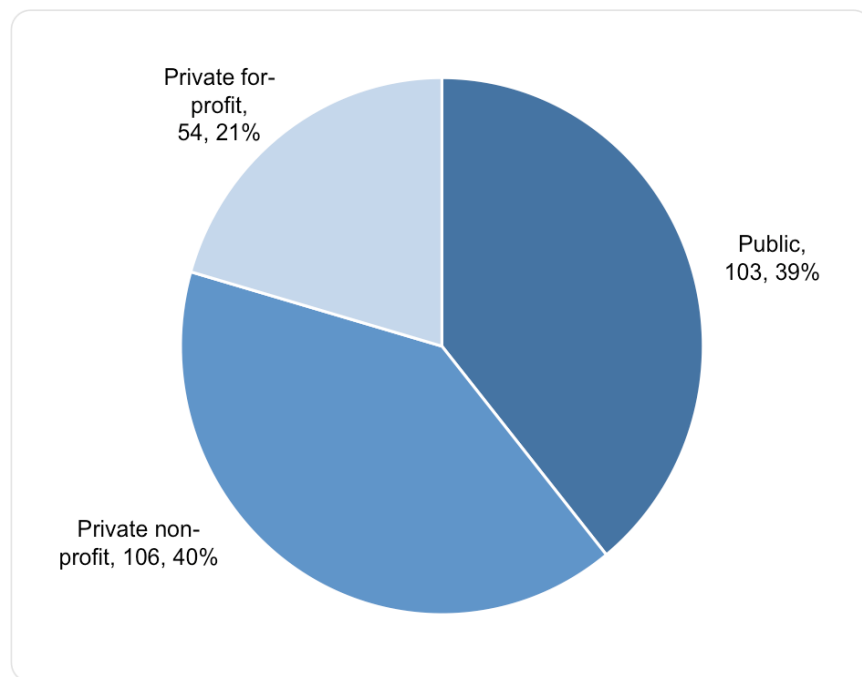
Figure 2. Number of Hospitals by Control Type From 2015

RHP Groupings: RHP Tier

RHPs are the basic geographic regions created for purposes of the DSRIP and UC Programs. All hospitals, including those participating only in the UC program, must participate in an RHP. Each RHP is classified as one of four Tiers based on the distribution of the State's low-income population residing within the RHP. Thus, the UC costs were examined by RHP Tiers (see Figure 3).

- Tier 1 RHP: Contains more than 15% share of the statewide population under 200% of the federal poverty level (FPL) for 2006–2010.
- Tier 2 RHP: Contains at least 7% and less than 15% share of the statewide population under 200% FPL for 2006–2010.
- Tier 3 RHP: Contains at least 3% and less than 7% share of the statewide population under 200% FPL for 2006–2010.
- Tier 4 RHP: An RHP is classified as Tier 4 if one of the following three criteria are met:
    1. The RHP contains less than 3% share of the statewide population under 200% FPL as for 2006–2010;
    2. The RHP does not have a public hospital; or
    3. The RHP has public hospitals that provide less than 1% of the region's UC.
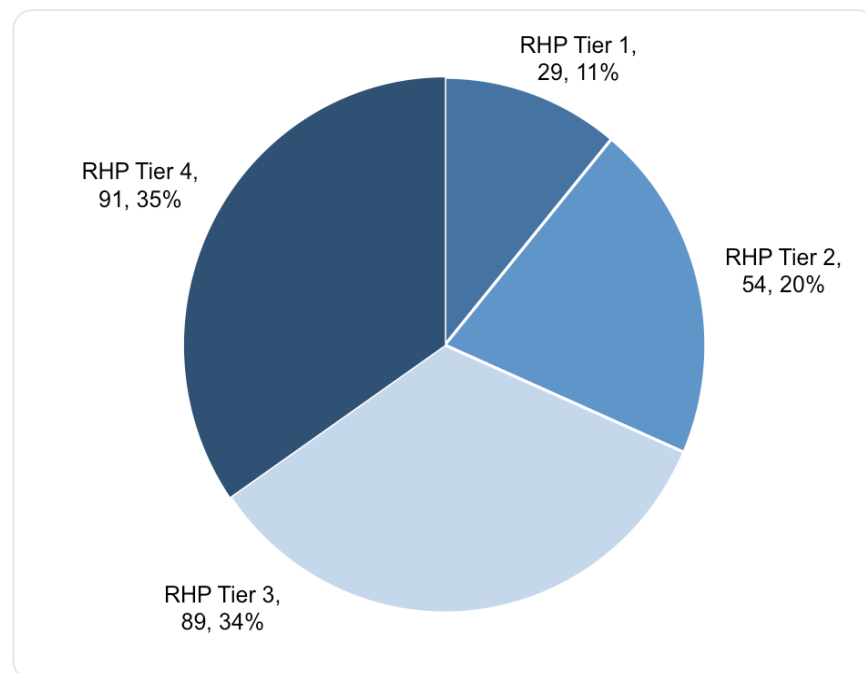
Figure 3. Number of Sampled Hospitals by RHP Tier

The percentage of the population under FPL was determined using the 2006–2010 American Community Survey. These tiers approximately represent a spectrum from the most urban to the most rural regions. For example, the only Tier 1 RHP is the Houston region (RHP 3). Figure 4 depicts the counties in each RHP (the RHP number is indicated inside county), and the RHP tiers are indicated by the shaded areas (darkest blue area is Tier 4). As RHP Tiers 1 and 2 both represented hospitals in large metro areas, we combined them in our subgroup analysis.

Figure 4. Regional Healthcare Partnership (RHP) Tier Map

RUCC Classification Status

Two different urban-rural classification systems were used to differentiate changes in UC for urban and rural hospitals. The first is the 2013 RUCC by the USDA Economic Research Services (United States Department of Agriculture, n.d.). RUCC classifies the degree of urbanization for each county along a continuum of nine codes based on the population size of metro areas within metropolitan counties, and by the degree of urbanization and adjacency to a metro area for nonmetropolitan counties. Each hospital was assigned the RUCC code for the county in which the hospital was located (Figure 5). To differentiate beyond the default USDA metro–non metro dichotomization, RUCC codes 1 and 2 were defined as urban, 3 to 7 as suburban, and 8 or 9 as rural.
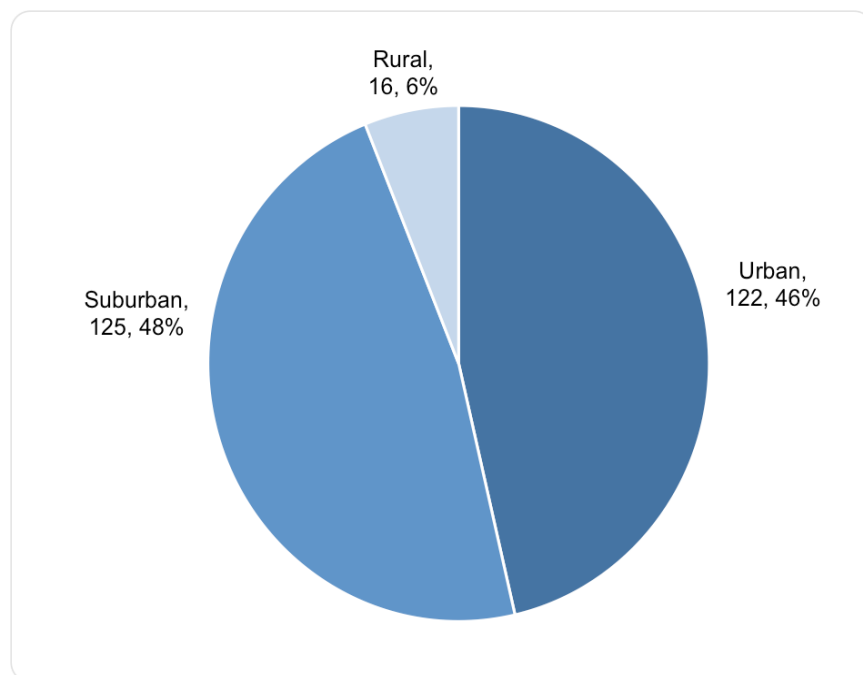
Figure 5. Number of Sampled Hospitals by RUCC Classification

Rider 38 Hospitals Classification

Rider 38 directs HHSC to reimburse rural hospital inpatient rates at a level to approximate full cost. Rural hospitals that met the Rider 38 qualification criteria (N=124) were also examined along with those non-Rider 38 hospitals (N=139) (see Figure 6). These criteria do not align directly with the RUCC classification.
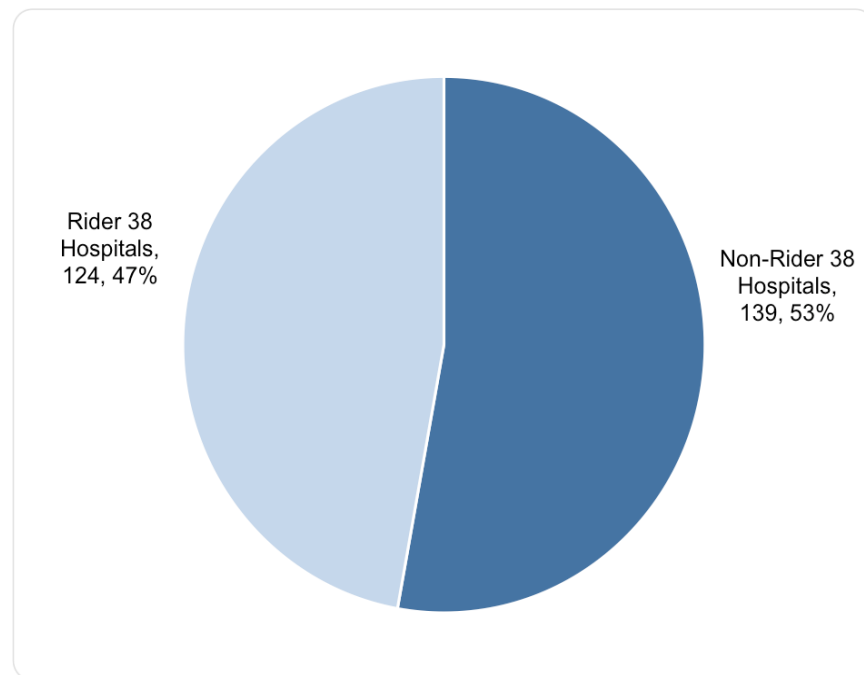
Figure 6. Number of Sampled Hospitals by Rider 38 Hospitals Classification

TREND ANALYSIS OF PROJECTED UC COST FOR THE FULL SAMPLE

In order to visualize the development of UC for all hospitals receiving UC payments in any year over the period of FY2010 to FY2013, a regression-based projection analysis was conducted for two dependent variables: Total shortfall less DSH payments (TSLD), and total shortfall less DSH and UC payments (TSLDU). The projected trend analysis uses a multivariate regression model to project estimated values for both of these dependent variables over a consistent set of hospitals with UC payments in any year from FY2010 to FY2013 (rather than restricting the trend analysis to hospitals with UC payments in every year, as in the primary trend analyses reported in the Executive Summary and in Appendix F). First, after selecting hospitals with at least 1 year of UC, a generalized linear regression model was built for TSLD and TSLDU, with the following predictors: Year, hospital control type (public, private for-profit, private non-profit), RHP tier, number of set-up and staffed beds, and whether it is a teaching hospital. After obtaining the regression model, any data with missing values for independent variables were coded with values from the most adjacent available year from the dataset, so that every year

had the same number of hospitals. The coefficients and the values of their corresponding independent variables were used to predict TSLD and TSLDU for individual hospitals in each year. Finally, the means for TSLD and TSLDU in each year were estimated along with a 95% confidence interval. The estimated means were the projected values of TSLD and TSLDU in each year of analysis to all hospitals with at least one year UC.

EFFECT OF DSRIP PROJECTS ON UC COSTS: HYPOTHETICAL INFERENTIAL ANALYSIS

This section details the design of a study that could be used to analyze the effect of DSRIP payments on UC cost, given additional years of post-intervention data. This multivariate regression model would estimate the association between hospital UC costs and DSRIP payments, both to the hospital (if any) and cumulatively to other hospitals in the same RHP (both lagged 1 year), accounting for hospital characteristics (such as provider type and size) and regional characteristics (such as rurality and RHP fixed effects).

The primary goal of this analysis is to see how DSRIP payment in the previous year affected UC cost in the following year adjusted for other covariates. Ordinary Least Squares (OLS) regression analysis is used to examine the association between DSRIP payment and Uncompensated Care cost, holding other covariates fixed. The main independent variables of interest relate to the level of DSRIP participation, both for a specific hospital and for other hospitals in the same RHP. Each hospital's own DSRIP participation (if any) was measured by accumulated DSRIP payment per hospital. The intensity of DSRIP activity within each RHP was calculated by subtracting accumulated DSRIP payment per hospital from the accumulated DSRIP payment per RHP. In addition to these key independent variables, we included additional independent variables to adjust for the effects of DSH payment and hospital characteristics, such as number of beds, teaching status, ownership type, and urban/rural status (measured alternatively as RHP tier or RUCC category). Furthermore, we included binary variables for each individual RHP to adjust for the fixed effect of each RHP. Finally, the trend over time is modeled either as year trend variable or year dummy variables.

Regression model:

$$\log(UC_{COST}) = \beta_0 + \beta_1 \log(Payment_{DSRIP}) + \beta_2 log(DSH) + \beta_3 T_t + \beta_4 ownership + \beta_5 rhptier(rucc) + \beta_6 teach + \beta_7 H_{it} + \delta_j + \varepsilon_{ijt}$$

T_t year trend or year dummy
H_{it} vector of time varying hospital characteristics
δ_j fixed effect of RHP
ε_{ijt} error term

A normality test for the UC cost variable verified that the distribution of the UC cost variable was skewed, with a long "right tail" often characteristic of cost variable distributions. Thus, we log-transformed the dependent variable to achieve a normal distribution for the error term post-transformation. The number of beds was log-transformed as well, which is common in economic

analyses of health expenditure issues (Finkelstein A, 2007). This allowed the estimated coefficients of the log-transformed independent variables to be interpreted as elasticity estimates. In other words, as the dependent variable and key independent variables were log-transformed, the coefficients of those independent variables are interpretable as a percentage change.

Unfortunately, as noted in the Executive Summary, this study design cannot be applied until additional years of more recent UC cost data are available. For example, the first year of DSRIP payment data represented FY2013, which in the model would affect UC cost in FY 2014, but UC cost data for FY2014 will not be available until early 2017. Thus, this analysis will be carried out at a later time.

STAKEHOLDER PERCEPTIONS

Data on stakeholder perceptions of the changes in UC payment were collected as part of the telephone survey deployed under Evaluation Goal 9 (EG 9) to collect data for the inter-organizational network analysis. The UC questions were added to the EG 9 survey to eliminate multiple survey invitations going to the same organizations. The sampling frame for the EG 9 survey included all organizations participating in DSRIP in each of the 20 RHPs. Many of the hospitals and physician providers surveyed also participate in the UC program. Other respondents represented community mental health centers and public health departments that were not eligible to participate in UC, but indicated familiarity with the program changes. More detail on the sampling strategy and survey design is available in Appendix C (Changes in Collaborations Among Organizations) of this report.

After completing the survey questions for the EG 9 network survey, respondents were asked about their familiarity with the changes to the UC program as part of the Demonstration. Those who indicated they were familiar with the changes were asked a follow-up question about how the UC changes have affected access to care for the underserved. Respondents also had the opportunity to explain and elaborate on their response with an open-ended question. Table 4 includes the survey questions related to UC changes. These were also included in the Interorganizational Network Survey instrument in Appendix C (Changes in Collaborations Among Organizations).

Table 4. Survey Items, Stakeholder Perceptions of Changes to UC Payment

Survey Question	Response Options
Are you familiar with the changes to Uncompensated Care as part of the Waiver Program?	Yes No
To the extent that you can, think about the uncompensated care program as distinct from ACA or other changes affecting health insurance coverage in general. Overall, would you say that changes in uncompensated care payment associated with the 1115 Waiver Program improved access to care for the underserved within your organization's service area, reduced access, or had no meaningful impact on access to care?	Improved Access to Care Reduced Access to Care Had no Meaningful Impact on Access to Care
Can you tell me more about that?	Open-ended

Note: These questions were included in the Evaluation Goal 9 Network Survey. Respondents answered these questions after completing the network study portion of the survey.

Quantitative results for the first two questions were analyzed using descriptive statistics, including response rates, frequencies, and percentages. These results are presented for the state overall and by RHP. Open-ended responses were analyzed using an iterative approach where individual responses were grouped into thematic areas, reviewed for consistency, and then regrouped into final themes to note similarities in responses across respondents.

RESULTS

TREND ANALYSES: COST DATA FROM 2010 TO 2013

The main results using a total of 353 hospitals that reported at least one year of UC cost between FY2010 and FY2013 (DSH/UC application data years 2012 and 2015) can be found in the Executive Summary. In this section unless otherwise specified, all years will refer to the year of the cost data (FY2010 to FY2013) rather than the applicate year (FY2012 to FY2015), which reflects the payment year. Here we present subgroup analysis using only the 263 hospitals that reported UC cost in all 4 years so that we have comparable subgroup samples. Following the subgroup analysis, we also present the difference in the results between the two samples. As noted in the Executive Summary, all dollar amounts were converted to 2012 constant dollars to adjust for inflation using annual average data for the Consumer Price Index (Bureau of Statistics, United States Department of Labor, n.d.) unless otherwise specified. (See section on *All Hospitals in Texas: Comparison between nominal dollars and constant 2012 dollars for overall trend.*)

By Hospital Type

Trend in Uncompensated Care Costs

Disproportionally higher amounts of uninsured shortfall per bed are reported for public hospitals and distinguish them from private hospitals: 13% and $20,035 overall increase leave the 2013 uninsured shortfall at $177,000 per bed, while private non-profit only have $63,000, private for-profit $43,000 (see Figure 7). However, hospitals in all control groups went through an overall increase in total shortfalls, despite the slight decrease from 2011 to 2012 for public ($11,938 and 5%) and private for-profit hospitals ($4,948 and 7%).
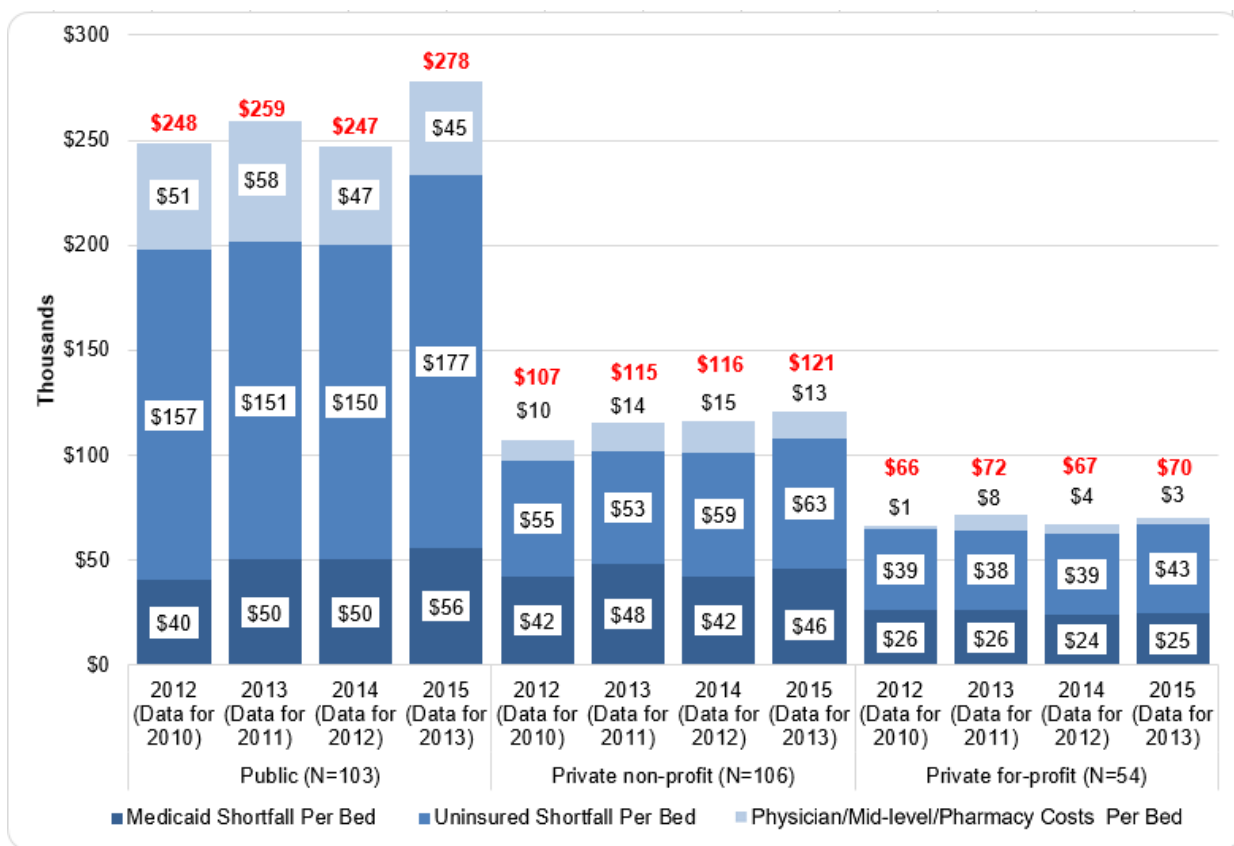
Figure 7. UC Costs by Hospital Type

Trend in Uncompensated Care Payments

The total hospital UC estimate was adjusted for the level of DSH and UC payments received by the hospital to yield an estimate of the total shortfall less DSH and UC payments (TSLDU). Figure 8 shows that public hospitals have an increasing amount of TSLDU mainly due to the decrease in UC Pool payments. From 2011 to 2013, the shortfall amounts (before any payments) for public hospitals increased by $19,146 (7%). Meanwhile, the UC payments decreased by $38,870 (29%). Despite the $2,722 (3%) increase in the DSH payments per bed, the TSLDU for public hospitals increased by $55,294 (158%). Even though private hospitals are less affected, they also went through steady increase of TSLDU mainly due to the decrease in UC payments from FY2013 to FY2015 (data for 2011 to 2013). By FY2015, accounting for number of beds, public hospitals represented 55% (97/(97+51+28)) of UC payments per bed and 52% (=90/(90+56+27)) of total shortfall after all payments per bed.
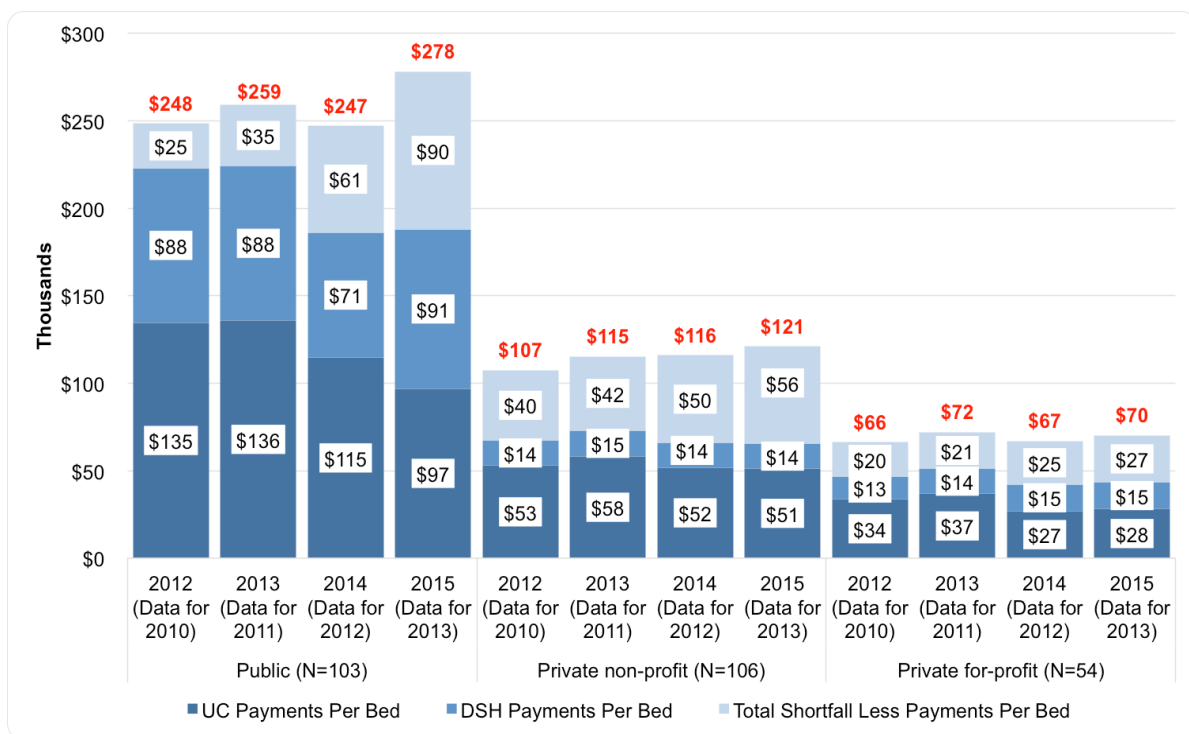
Figure 8. DSH and UC Payments by Hospital Type

Percent of UC Cost after DSH Payments Made up by Payments from the UC Pool

As shown in Figure 9, public hospitals had the highest percentage of UC pool payment covering 2010 costs (84%), while private hospitals had lower percentages (57% for non-profit and 63% for for-profit)[15]. However, hospitals in all control types experienced continuous decreases in the percentage of UC payments covering costs, and they all reached around 50% coverage rate for FY2013 costs: 52% for public, 48% for private non-profit, and 51% for private for-profit hospitals.
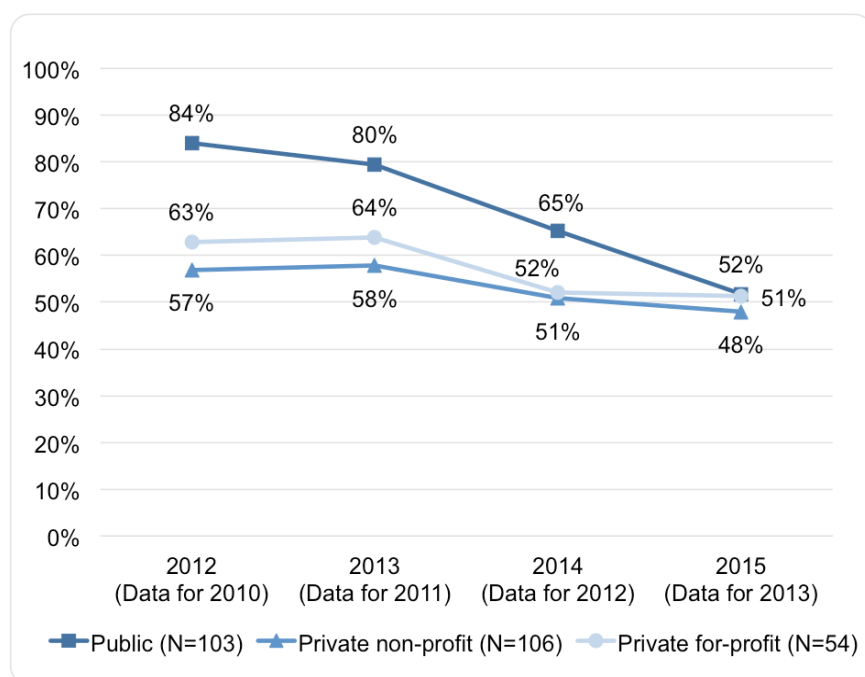
Figure 9. Percentage of Unreimbursed Costs Paid by Hospital Type

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[15] The percentage of UC payment to public hospitals was calculated without excluding the IGTs received.

By RHP Groupings: RHP Tier

Trend in Uncompensated Care Costs

Figure 10 (UC costs by RHP Tier), hospitals in the RHP tiers with the greatest shares of low-income population (Tiers 1 and 2) had greater hospital unreimbursed costs compared to hospitals in RHPs in Tiers 3 or 4. Tiers 1 and 2 hospitals witnessed an increase in total shortfalls per bed from 2010 to 2013 ($21,800 and 14%), while Tiers 3 and 4 had relatively stable unreimbursed costs. The increase of total shortfalls in all RHP tier hospitals mainly resulted from the increase in uninsured shortfall per bed: 14% and $12,623 for Tiers 1 and 2, 10% and $5,659 for Tier 3, as well as 19% and $8,331 for Tier 4.
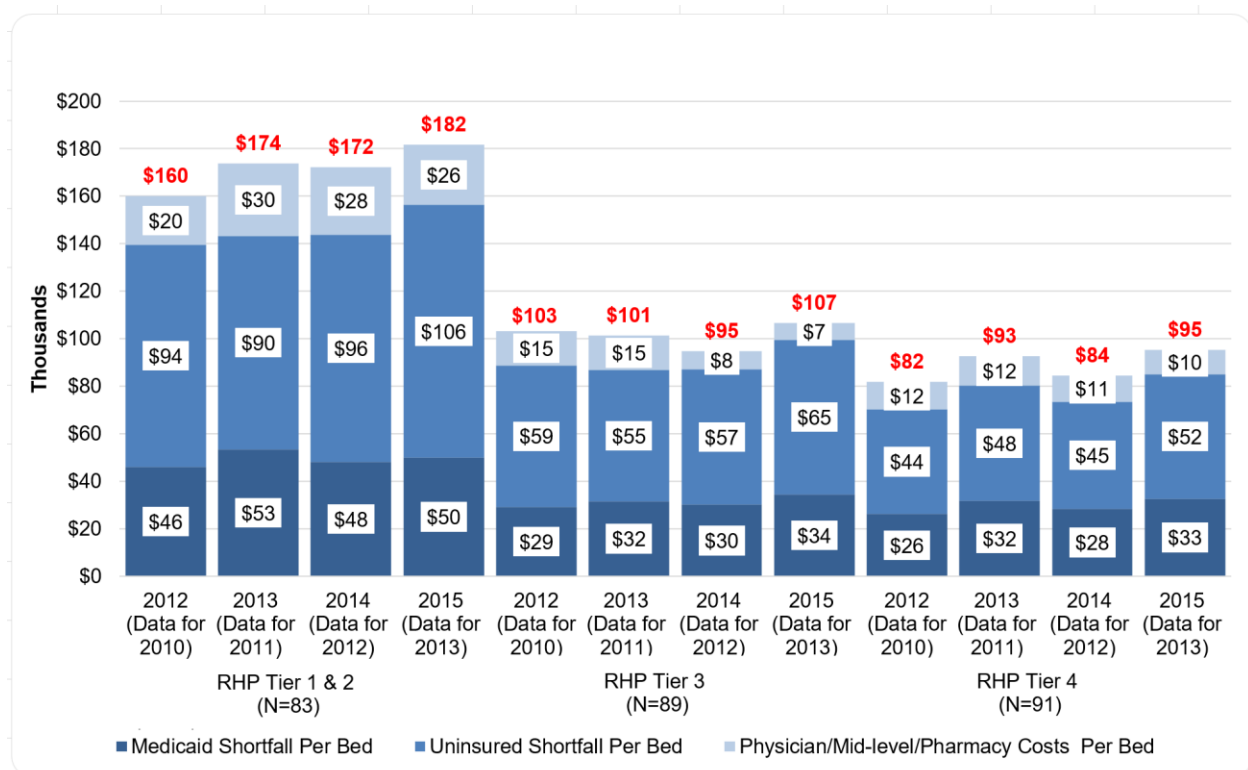
Figure 10. UC Costs by RHP Tier

Trend in Uncompensated Care Payments

As shown in Figure 11, hospitals in all RHP Tiers went through increases in total shortfall less DSH and UC payments (TSLDU), especially those in Tiers 1 and 2. From 2011 to 2013 the UC pool payments per bed for hospitals in Tiers 1 and 2 dropped ($27,200 and 28%), while DSH payments stayed relatively stable. This resulted in the huge increase of TSLDU ($31,970 and 77%).
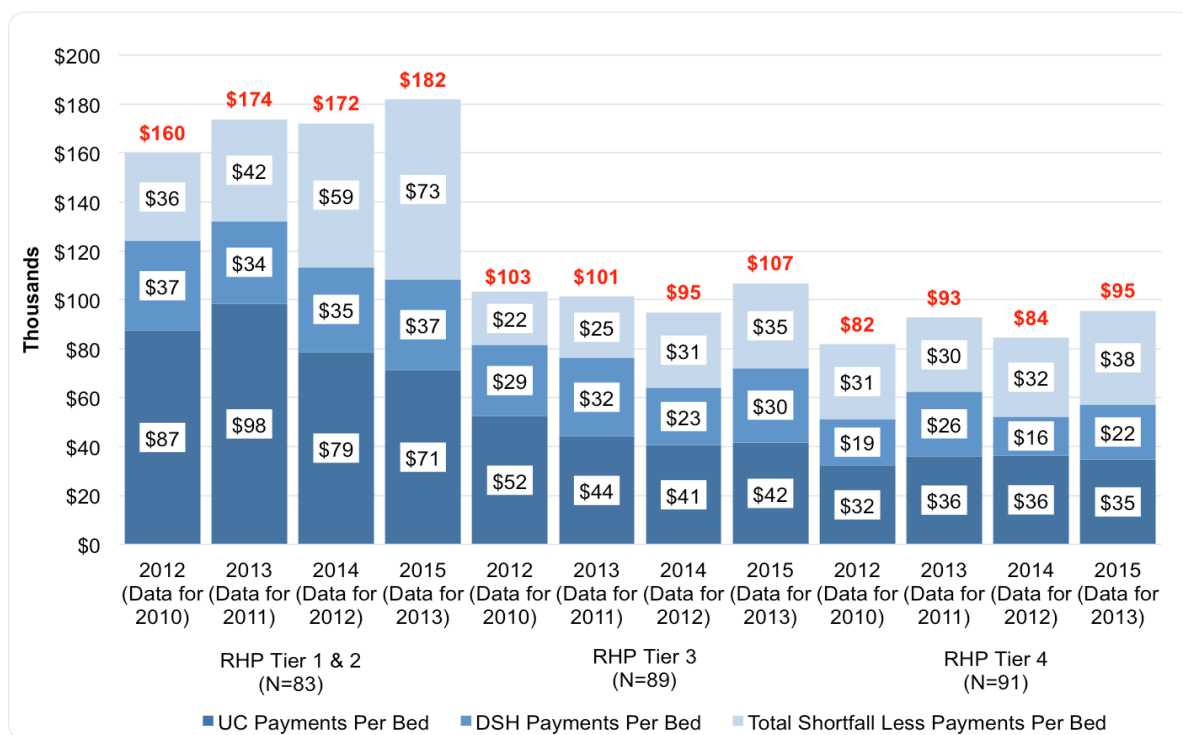
Figure 11. DSH and UC Payments by RHP Tier

Percent of UC Cost after DSH Payments Made up by Payments from the UC Pool

In 2010, hospitals in RHP Tiers 1, 2, and 3 had similar percentages of UC Pool payments covering TLDU (around 70%), while RHP Tier 4 had a smaller number (51%). However, all of the percentages dropped to around 50% in 2013: 49% for Tiers 1 and 2, 55% for Tier 3, and 48% for Tier 4 (Figure 12).
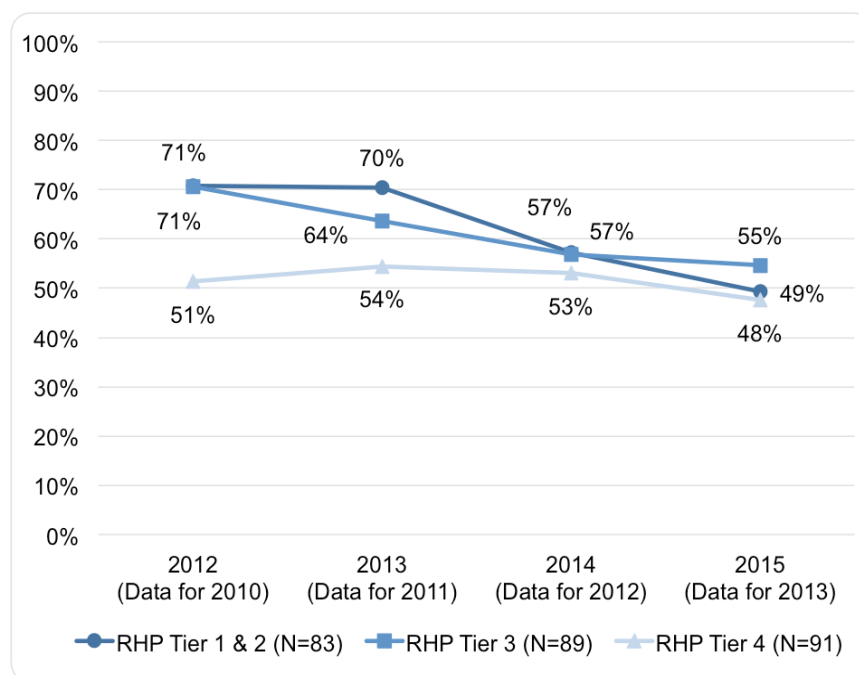
Figure 12. Percentage of Unreimbursed Costs Paid by RHP Tier

By RUCC Classification

Trend in Uncompensated Care Costs

As shown in Figure 13, hospitals with a RUCC urban classification had greater levels of total unreimbursed costs than suburban and rural hospitals. The rate of increase from 2010 to 2013 for urban hospitals is smaller than that of suburban hospitals (11% versus 19%), but the amounts are similar ($15,491 versus $14,843 per bed). The lower rate of growth for urban hospitals total shortfall was in part a result of a 6% decrease in Medicaid shortfall components from 2011 to 2013, compared to an increasing Medicaid shortfall components for suburban hospitals.
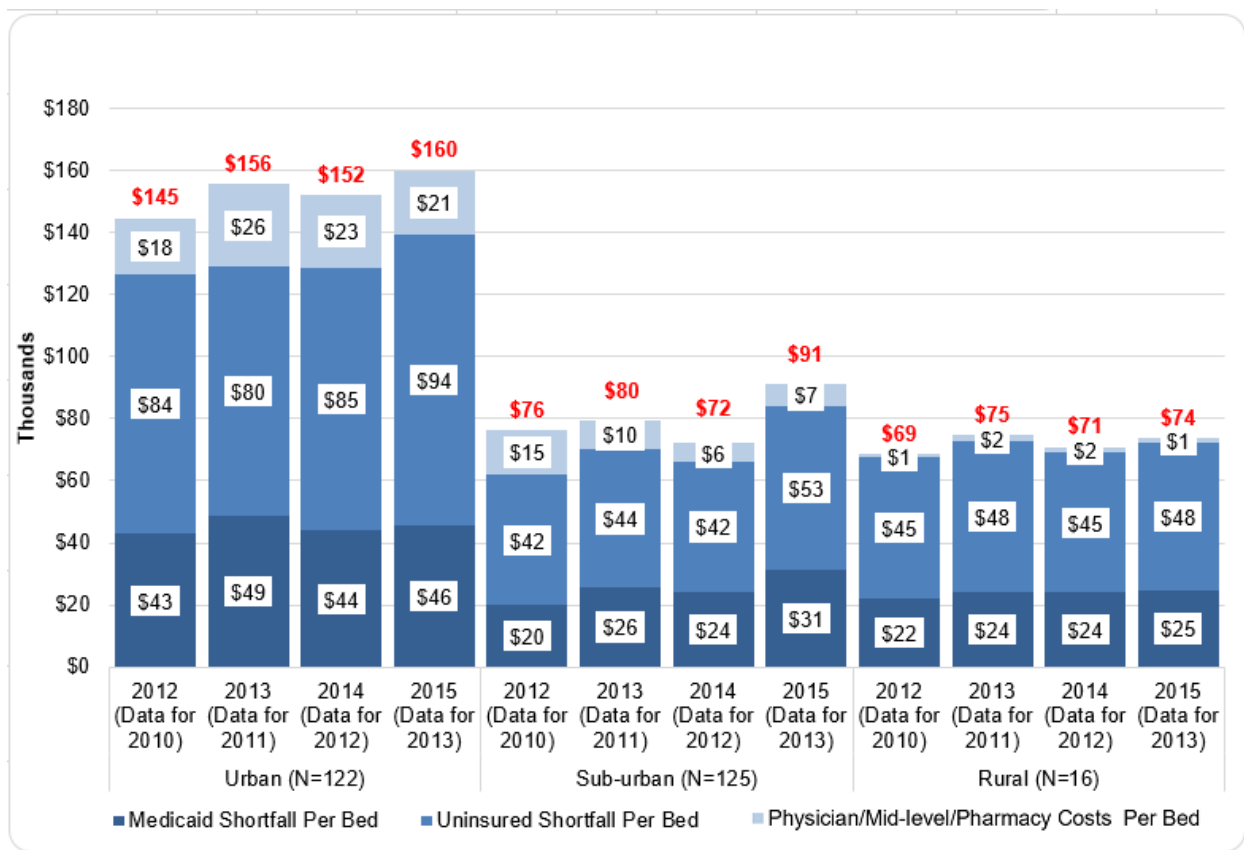
Figure 13. UC Costs by RUCC Classification

Trend in Uncompensated Care Payments

The UC pool payments per bed for urban hospitals increased from 2010 to 2011 (9% and $6,940), but decreased from 2011 to 2013 (26% and $22,055). In comparison, the UC pool payments per bed for suburban hospitals decreased from 2010 to 2011 (12% and $3,961), but increased from 2011 to 2013 (22% and $6,372). Notably, the UC pool payments per bed for rural hospitals had a dramatic increase from 2010 to 2013 (62% and $23,476), despite a slight decrease from 2011 to 2012 (8% and $3,960). These differences in part result in variation in the trends of total shortfall less DSH and UC payments per bed from 2010 to 2013: $29,894 and 86% increase for urban hospitals, along with $8,975 and 47% increase for suburban hospitals, and $19,825 and 67% decrease for rural hospitals.
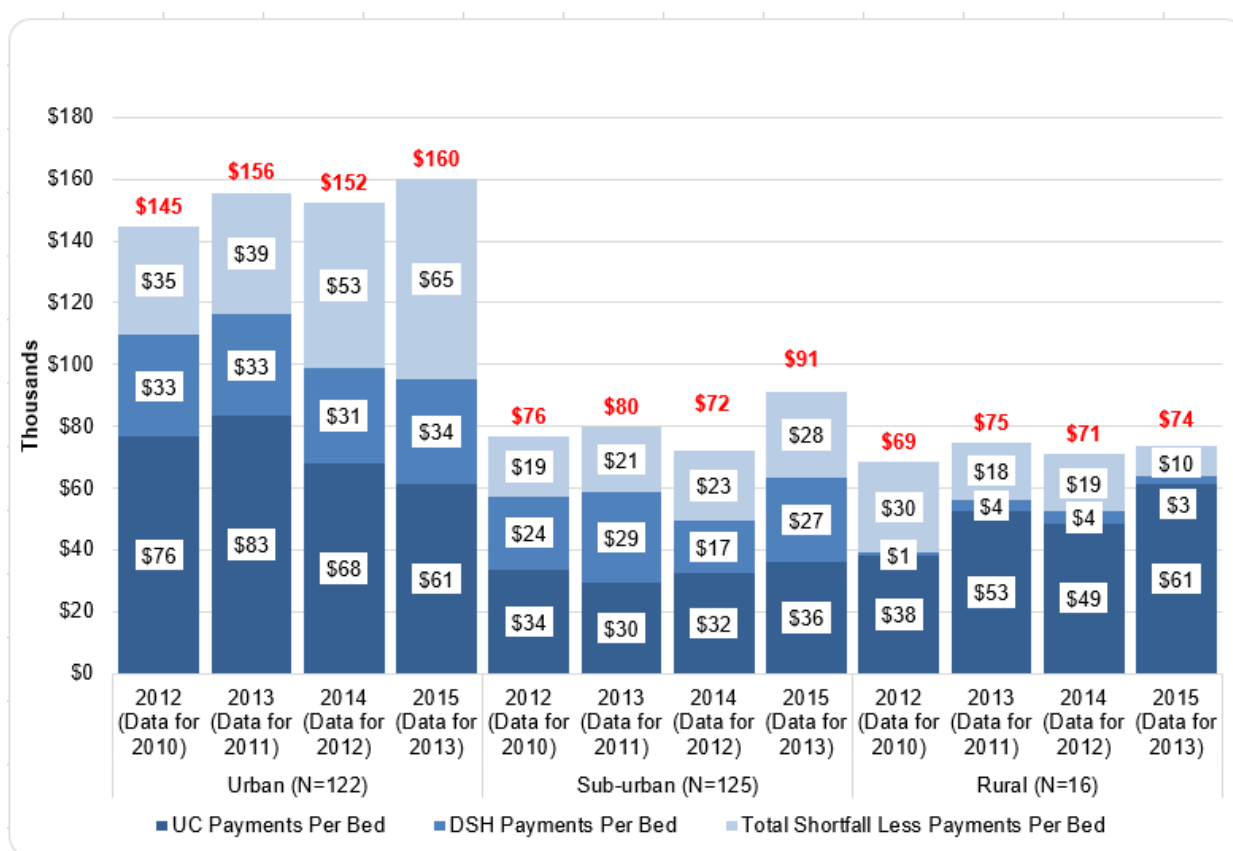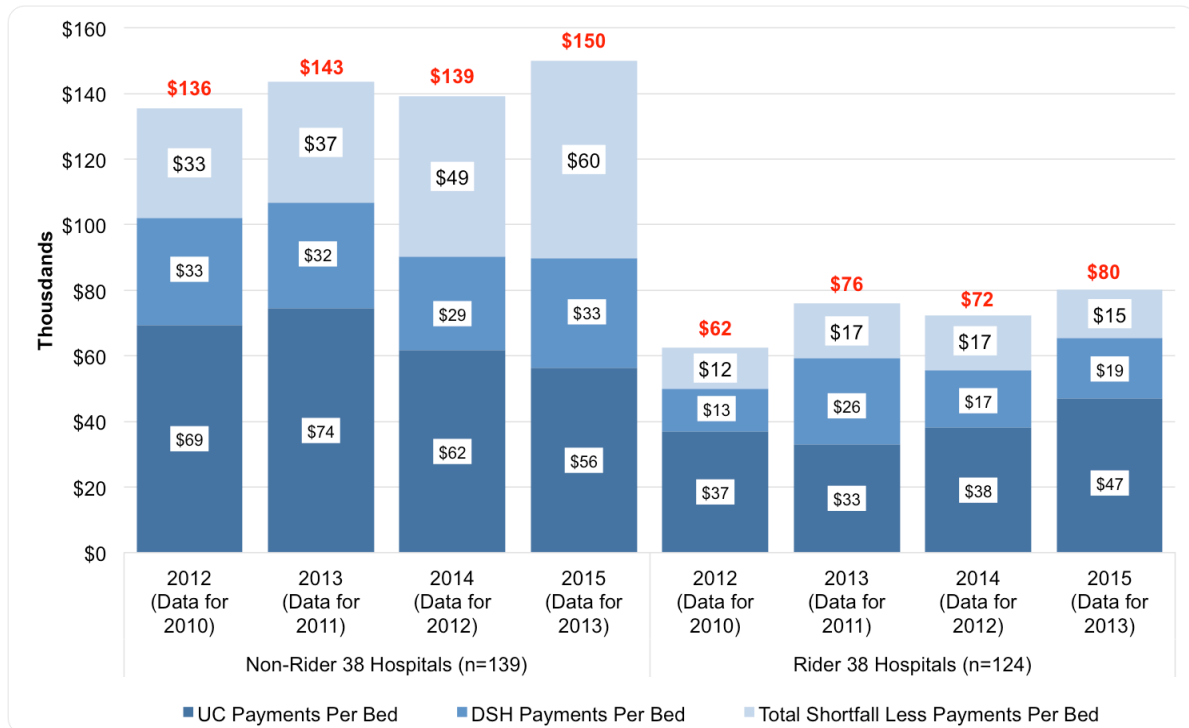

Figure 14. DSH and UC Payments by RUCC Classification

Percent of UC Cost after DSH Payments Made up by Payments from the UC Pool

Rural hospitals stood out with an increasing percentage of UC pool payments covering TSLD, while urban and suburban hospitals both experienced decreasing percentage (Figure 15). All categories started at similar percentage of UC covering TSLD: 69% for urban, 64% for suburban, while rural had the lowest at 56%. However, the rural hospitals rebounded to 86% coverage in 2013, leaving urban at 49% and suburban at 56%. To summarize, rural hospital experienced major increase, suburban hospitals are relatively stable in UC coverage percentage, while urban hospitals suffered from major decrease in UC coverage percentage.
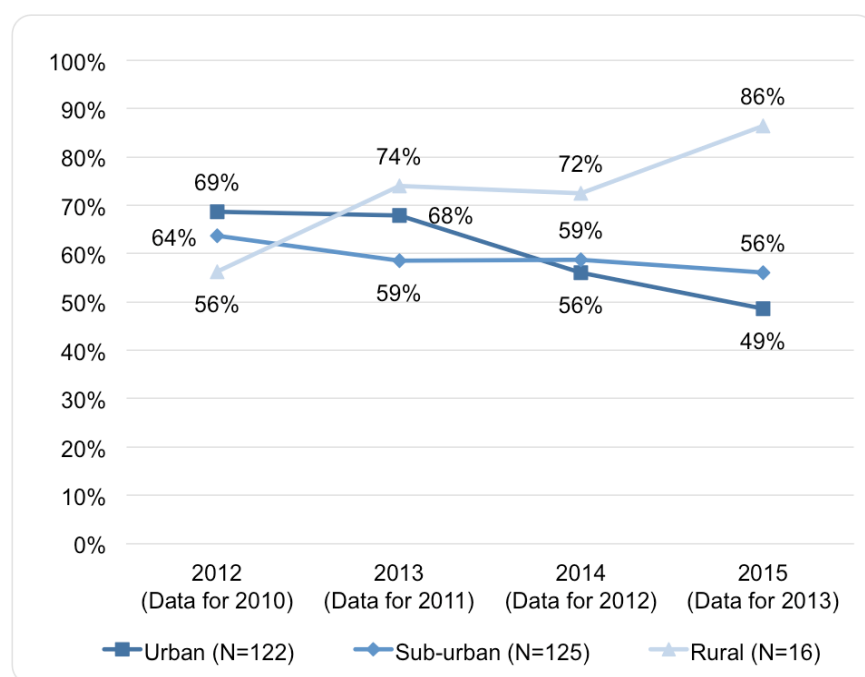
Figure 15. Percentage of Unreimbursed Costs Paid by RUCC Classification

By Rider 38 Hospitals Classification

Trend in Uncompensated Care Costs

As shown in Figure 16, Rider 38 hospitals, total shortfalls per bed increased from 2010 to 2013 ($17,768 and 28%), despite the decrease from 2011 to 2012 ($3,690 and 5%). Even though non-Rider 38 hospitals had larger total shortfalls than Rider 38 hospitals, they increased at a lower rate (11% versus 28%) and smaller amount ($14,362 versus $17,768 per bed). Since the physician, mid-level, and pharmacy services components for non-Rider 38 hospitals decreased from 2011 to 2013 ($5,207 and 22%), the increase in total shortfall was mainly a result of increasing uninsured shortfalls ($13,000 and 17%).
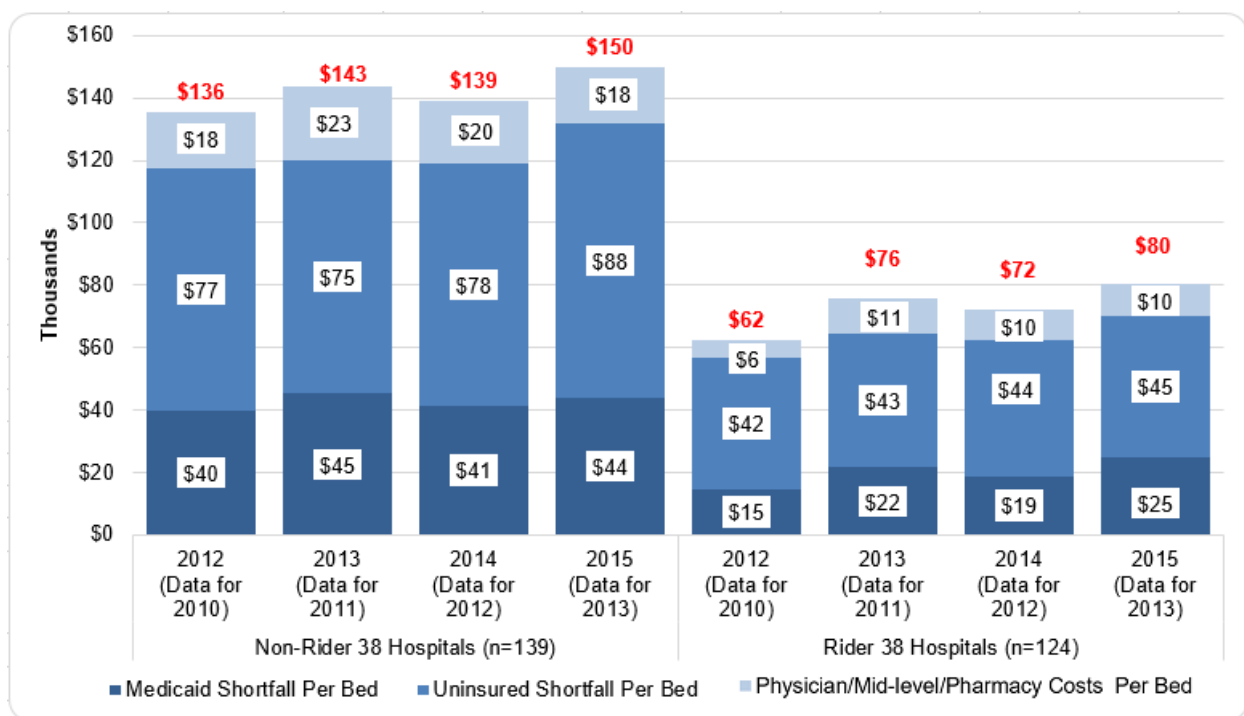
Figure 16. UC Costs by Rider 38 Hospitals Classification

Trend in Uncompensated Care Payments

From 2011 to 2013, the TSLDU per bed for non-Rider 38 hospitals had a dramatic increase of $26,699 and 80% (Figure 17). Since the DSH payments are relatively stable, the increase in TSLDU was mainly due to the decrease in UC pool payments ($13,135 and 19%). However, Rider 38 hospitals experienced a decrease in TSLDU from 2011 to 2013 ($1,978 and 12%) even though DSH payments decreased ($7,573 and 29%) due to the increase in UC pool payments ($13,810 and 42%).

Figure 17. DSH and UC Payments by Rider 38 Hospitals Classification

Percent of UC Cost after DSH Payments Made up by Payments from the UC Pool

The Rider 38 hospitals started with a slightly higher percentage of UC covering TSLD (75%) than non-Rider 38 hospitals in 2010, dropped down to lower value of 66% in 2011, and then rebounded to 76% in 2013 (Figure 18). On the other hand, non-Rider 38 hospitals experienced a major drop from 2011 to 2013 (67% to 48%).
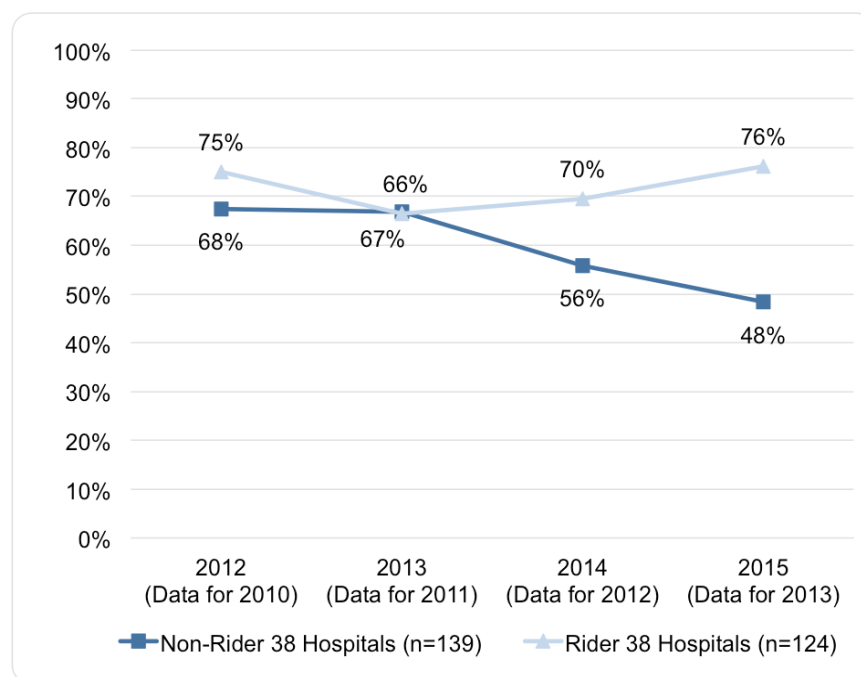
Figure 18. Percentage of Unreimbursed Costs Paid by Rider 38 Hospitals Classification

All Hospitals in Texas Comparisons

When referring to all hospitals in Texas, we are referring to those hospitals that reported at least 1 year of UC costs (N=353). Each year, a different number of hospitals submitted the DSH/UC application: 290 in 2012, 333 in 2013, 319 in 2014, and 329 in 2015. Data in each year represented costs 2 years prior to the reporting years, and payments made that year to compensate the corresponding costs.

Comparison between Nominal Dollars & Constant 2012 Dollars for Overall Trend

While an analysis of trends in costs expressed in nominal dollars can be useful for some purposes, such as budget projections, Evaluation Goal 5 calls for an assessment of the potential impact of DSRIP interventions on UC costs. When costs are measured over time, it is necessary to adjust for inflation to measure changes in constant-dollar (or "real") costs. This eliminates any change in costs attributable to price inflation from changes in costs due to

different levels of resource utilization over time. Based on the Consumer Price Index (All Items), prices on average increased by 6.8% over the 4 year period covered in the report (2010-2013).

As the data represents costs 2 years prior to the reporting year, different inflation adjustments were conducted for cost and payment items. The 2012 constant dollar was used as the reference. Cost items were adjusted based on the year cost occurred, while the payment items were adjusted based on the year payment was received (data reported). To verify the validity of using 2012 constant dollars in discovery of trends in UC, we compare the results between the shortfalls before and after adjustment for both cost and payment components. Note that this is the only section of the appendix that uses nominal dollars in the analysis.

Trend in Uncompensated Care Costs

As shown in Figure 19 and Figure 20, we used FY2012 constant dollars, so all costs amounts changed except for those costs that occurred in 2012. Given the general rate of inflation from FY2010 to FY2013, the amounts in 2010 and 2011 increased while that in 2013 decreased after constant dollar conversion.
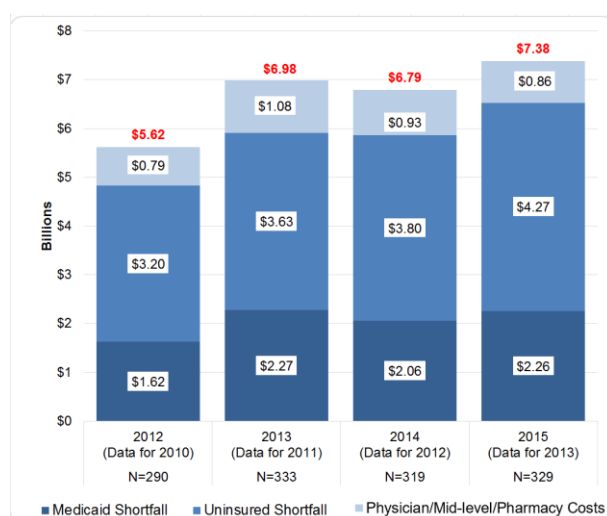
Figure 19. Overall UC Costs in Nominal Dollars
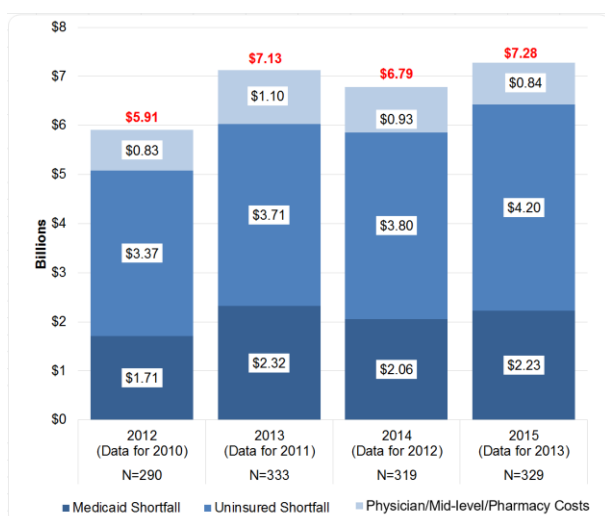
Figure 20. Overall UC Costs in Constant Dollars

Trend in Uncompensated Care Payments

Similarly for payment items (shown in Figure 21 and Figure 22) all payment amounts changed except for those payments received in 2012 (at the beginning of timeline). Due to the general inflation from 2012 to 2015, adjusted payment amounts from 2013 to 2015 were all less than the unadjusted values. This generated a flattened trend in the increase of total shortfalls as well as payments, which reflect the shortfall and payment amounts more accurately.
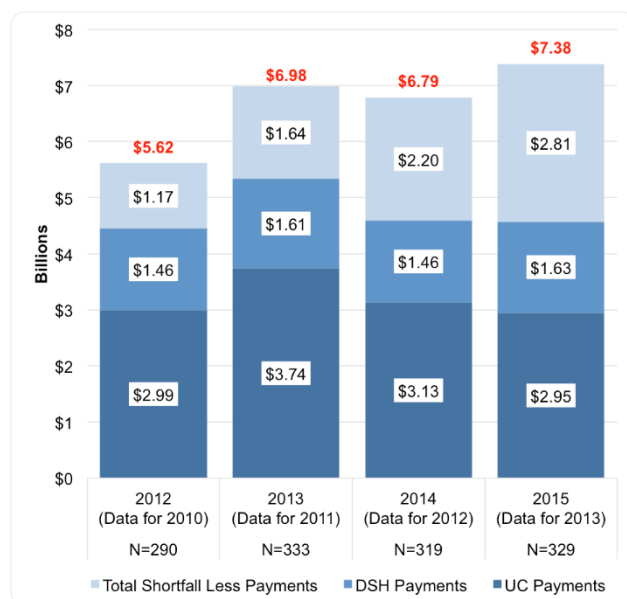

Figure 21. Overall Payments in Nominal Dollars
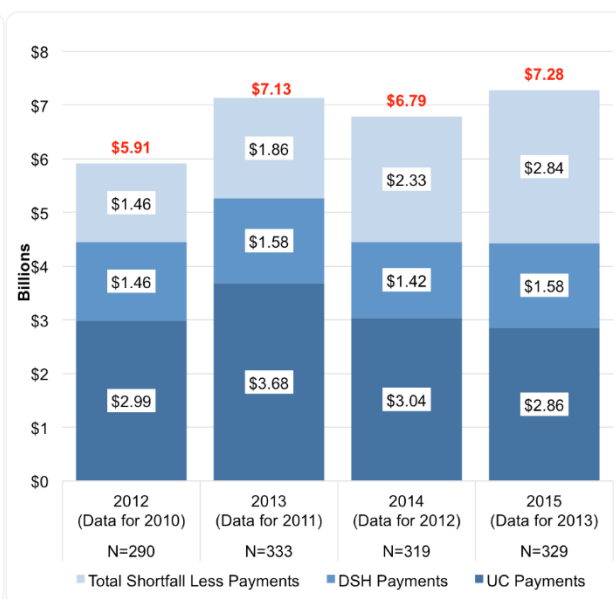
Figure 22. Overall Payments in Constant Dollars

Percentage of UC Cost after DSH Payments Made up by Payments from the UC Pool

Given the difference in adjustment for costs and payments, the percentage of UC Pool payments covering UC shortfalls are also different for data in nominal dollars and constant 2012 dollars (see Figure 23 and Figure 24). However, the analysis in constant dollars reflects the actual trend more accurately. For example in 2013 application data, when using nominal dollars compared to constant 2012 dollars, the payments were overestimated (based on 2013 dollars), but the costs were underestimated (based on 2011 dollars). This leads to an overestimated percentage of UC pool payment covering UC shortfalls.
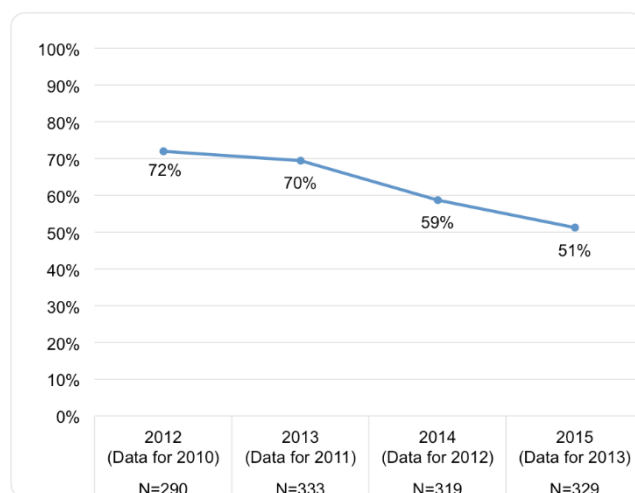
Figure 23. Percentage of UC in Nominal Dollars   Figure 24. Percentage of UC in Constant Dollars
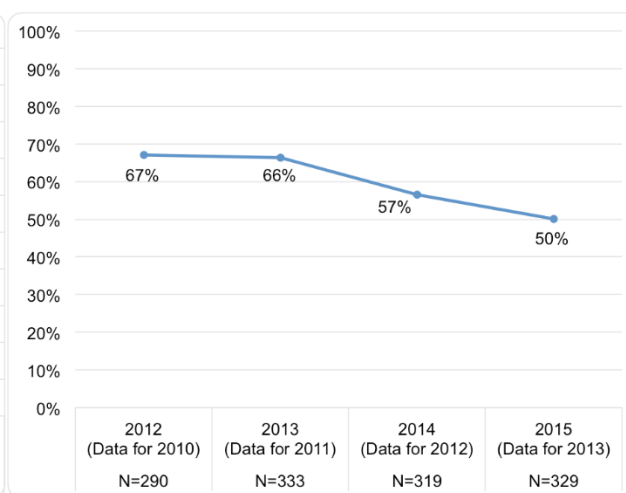
Therefore, we used constant 2012 dollars in all graphs in this report for accurate depiction of trends in UC.

Comparison between Full List of Hospitals and Those with UC in All Years

Among the 353 hospitals reporting at least 1 year UC from 2012 to 2015 (costs occurred between 2010 and 2013), 263 hospitals reported UC for all four years. The full list of 353 hospitals representing all actual UC costs in Texas were used for the overall state analysis in the executive summary. However, the subgroup trend analysis done in this appendix was based on the subsample of 263 hospitals that had data for all years so that the data over time was comparable. To better understand the differences between full list of hospitals (N=353) and hospitals with UC in all years (N=263), we compared the differences of hospital characteristics for those included (N=263) and excluded from (N=90) our sample. Comparisons were conducted for costs, payments, and percentage of UC pool payments covering UC shortfalls. While there are statically significant differences between the hospitals excluded from analyses (N=90) and the hospitals included (N=263), the hospitals included reflect the characteristics of all hospitals experiencing Medicaid shortfalls, uninsured shortfalls, and physician, mid-level, and pharmacy costs in every year.

Inclusion Analysis: Comparing Characteristics.

The hospitals excluded and included have statistically significant differences in control type, RUCC group, and Rider 38 status (see Table 5). The hospitals included in our sample (N=263) are more publicly controlled, located in suburban and rural areas, and belong to the Rider 38 category, compared to those excluded from the sample (N=90).

Table 5. Comparison Between Excluded and Included Hospitals

Category	Characteristics	Percentage in Excluded Hospitals (N=90)	Percentage in Included Hospitals (N=263)	% Diff (Included - Excluded)	*P*-value from Chi-square test
Control Type	Public	17 %	39	22	<0.001
	Private non-profit	41 %	40	-2	
	Private for-profit	42 %	21	-21	
RHP Tier	1	13 %	11	-2	0.842
	2	22 %	21	-2	
	3	34 %	34	-1	
	4	30 %	35	5	
RUCC group	Urban	66 %	46	-19	0.006
	Suburban	32 %	48	15	
	Rural	2 %	6	4	
Rider 38 Status	No	68 %	53	-15	0.014
	Yes	32 %	47	15	
Teaching Status	No	98 %	94	-3	0.183
	Yes	2 %	6	3	
Percentage by category	(Total N=353)	25 %	75		

Trend in Uncompensated Care Costs

Even though the number of hospitals reporting UC in all 4 years included 79%-91% of all hospitals in all years, the 263 hospitals included in the sample represented 83%~98% of Medicaid shortfalls, 87%~98% of uninsured shortfalls, and 91%~93% in costs for physician, mid-level, and pharmacy services.

The general trend in UC costs were similar between the two samples, but with less differences in the smaller sample as depicted in Figures 25 and 26. As shown in Figure 26 from 2010 to 2013, overall UC costs increased from $5.7 billion to $6.4 billion (reflecting a 12% increase), with a $433 million (13%) increase in the uninsured shortfall and $215 million (13%) increase in Medicaid shortfall accounting evenly for the overall increase. Apart from the overall increase trend, there was a slight decrease in uninsured shortfall ($90 million and 3%) from 2010 to 2011, as well as a slight decrease in Medicaid shortfall ($176 million and 9%) from 2011 to 2012. The costs for physician, mid-level, and pharmacy services had slight impact on the overall costs, reaching its peak at $1.0 billion in 2011, and then decreasing to $780 million in 2013.
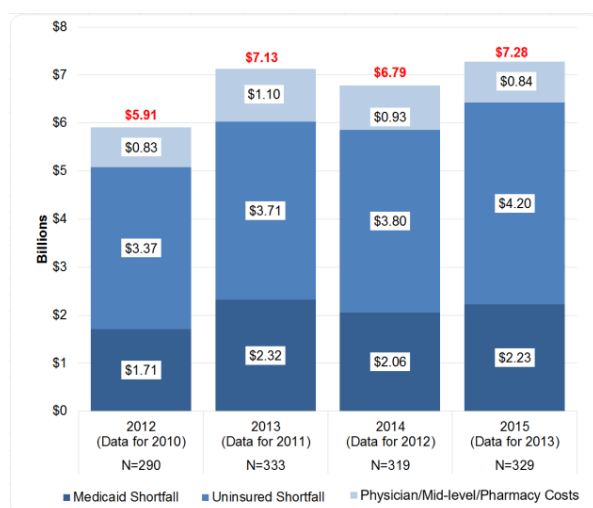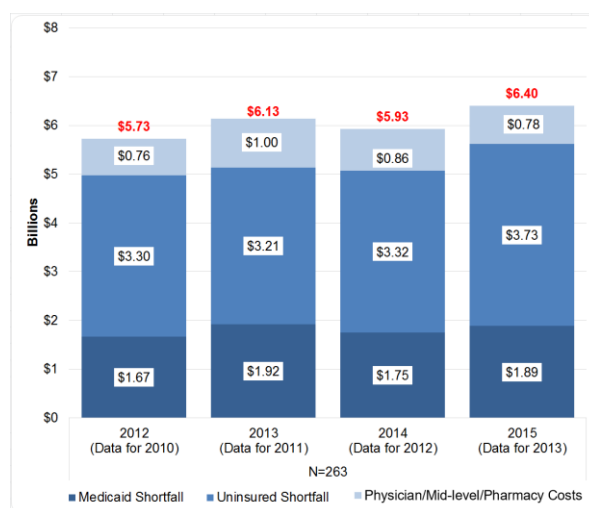

Figure 25. Overall UC Costs for All Hospitals

Figure 26. Overall UC Costs for Sampled Hospitals

Trend in Uncompensated Care Payments

As for payments, the 263 hospitals in the sample represented 87%-94% DSH payments and 87%~99% UC Pool payments (Figure 27 and Figure 28).

The UC payment trends are also similar between the two samples, but again with less differences in the smaller sample as shown in Figures 27 and 28. There was an overall increase in TSLDU ($1.1 billion and 78%), mainly due to the decrease in UC payments. UC payment had a slight increase of $197 million (7%), from 2012 to 2013 (data for 2010 to 2011) followed by a steady decrease of $676 million (21%) from 2013 to 2015 (data for 2011 to 2013). DSH payments stayed fairly stable over this time. Note these data predate the phased reductions in DSH payments under ACA, now scheduled to begin in FFY2017.
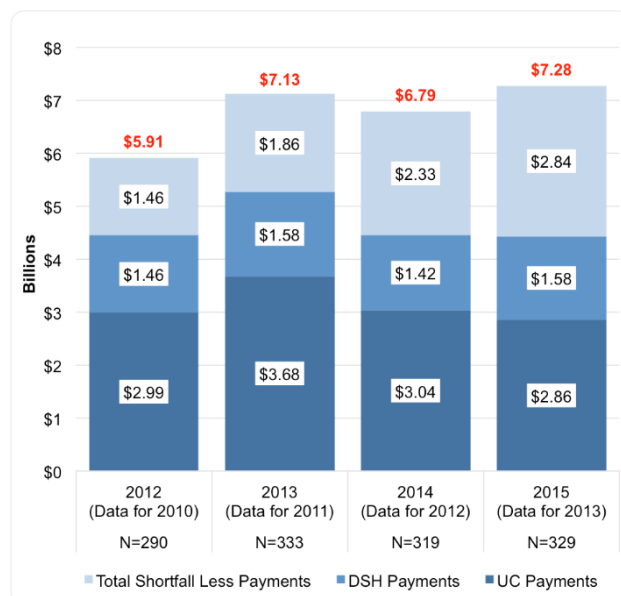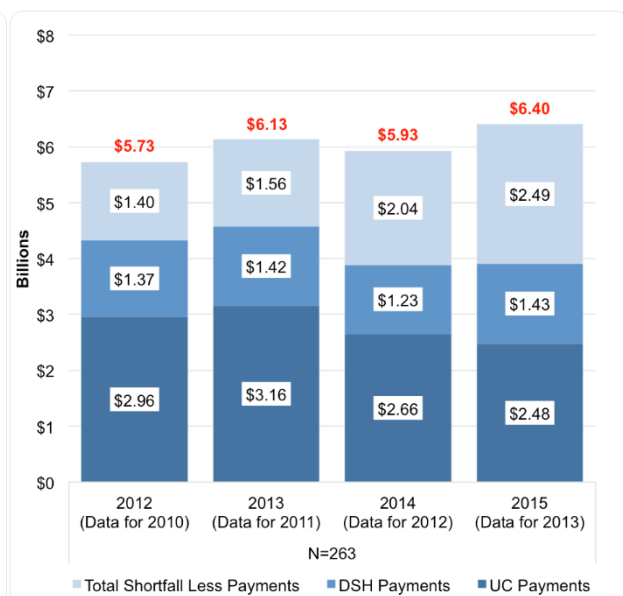

Figure 27. Payments for All Hospitals

Figure 28. Payments for Sampled Hospitals

Percent of UC Cost after DSH Payments Made up by Payments from the UC Pool

The full list of hospitals (N=353) and sampled hospitals (N=263) have shown similar trends in percentage of UC pool payments covering TSLD (see Figure 29 and Figure 30). For hospitals reporting UC for all four years, the percentage of UC pool payments covering TSLD underwent a continuous decrease from 68% in 2012 to 50% in 2015, mainly due to the major decrease in UC pool payments and increased amount of UC costs.
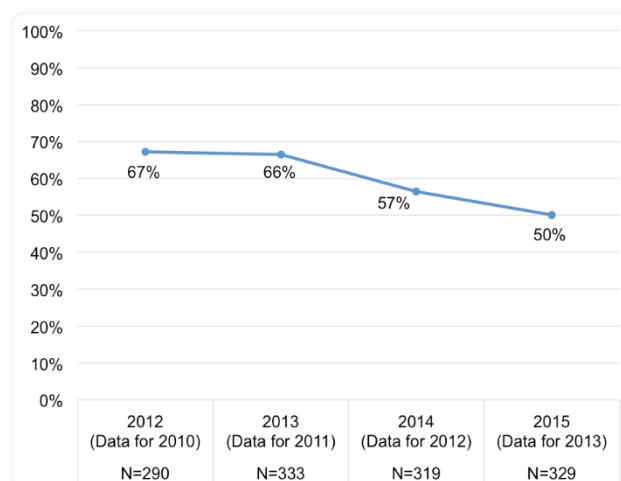

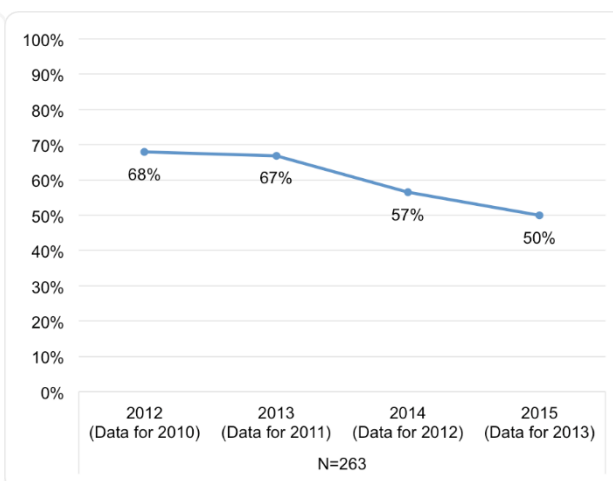Figure 29. Percentage of UC for All Hospitals

Figure 30. Percentage of UC for Sampled Hospitals

TREND ANALYSIS OF PROJECTED UC COST FOR THE FULL SAMPLE

Altogether, 353 hospitals with at least 1 year UC were selected to be included into the trend analysis of projected values for TSLD and TSLDU across all 353 hospitals.

Regression for TSLD exhibited statistically significant associations with hospital control group types, RHP Tiers, number of beds, and teaching status. Compared to public hospitals, being a private non-profit hospital is predicted to result in $10.1 million less TSLD, while being private for-profit is predicted to result in $17.2 million less TSLD. The predicted impact for hospitals in RHP Tiers 3 and 4, compared to hospitals in RHP Tier 1 and 2 (combined) is to reduce average TSLD by $11.3 million and $11.5 million, respectively. A one unit increase in number of beds was predicted to bring $109,000 more TSLD to hospitals, while being a teaching hospital was predicted to bring an average of $38.4 million TSLD to hospitals.

Figure 31 and Figure 32 depict the projection graph of TSLD using coefficients and values of hospital characteristics. The mean predicted value for TSLD increased from $5.3 billion to $5.9 billion (12% and $650 million) from 2010 to 2011, but experience relatively smaller amount of increase in later years. From 2011 to 2013, the mean predicted value of TSLD increase at an annual average rate of 4.5%, reaching $6.5 billion in 2013.
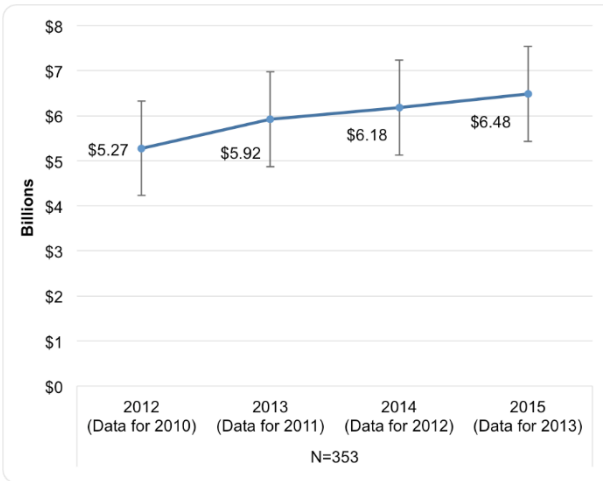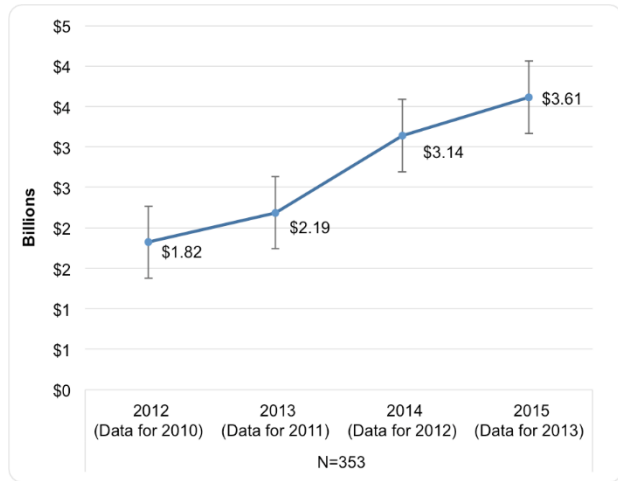
Figure 31. Projection Analysis of TSLD

Figure 32. Projection Analysis of TSLDU

The regression analysis prior to projection analysis for TSLDU has shown statistically significant effect from RHP tiers, number of beds, and teaching status, along with category "private for-profit" of hospital control type. Hospitals in RHP Tiers 3 and 4 were predicted to have a mean of $5.3 million and $4.4 million less TSLDU comparing to hospitals in RHP Tiers 1 and 2 (combined category), respectively. Teaching hospitals are predicted to have an average of $16.3 million more TSLDU than non-teaching hospitals. One unit increase in number of beds is predicted to increase TSLDU by $45,884. Hospitals were predicted to have an average of $1.0 million more TSLDU in 2011 than 2010, regardless of statistical insignificance. Meanwhile, year 2012 and 2013 were predicted to witness statistically significant increase in TSLDU comparing to 2010: $3.7 million and $5.1 million, respectively. All previous predictions were made under the condition of controlling other variables.

When the characteristics of hospitals were utilized to generate projected values of accumulative TSLDU for all hospitals in each year, a steadily increasing pattern was observed. The projected TSLDU for all hospitals was increased from $1.77 billion in 2010 to $3.50 billion in 2013 (98.4% increase). The greatest rate of increase appeared from 2011 to 2012, $0.94 billion and 44.4% difference. The 95% confidence intervals for all years are ± $0.44 billion. However, due to decreased UC payment, the TSLDU experienced an increase in obviously larger magnitude than TSLD.

UC POOL AND DSRIP POOL

There were a total of 345 hospitals participating in the UC pool (i.e., received UC payments) at least once between DY1 and DY4 (HHSC, 2016b). This excludes 8 hospitals with UC costs that did not receive any UC payments. Of these, 215 also participated in the DSRIP pool. In addition, there were 2 DSRIP-only hospitals and 78 DSRIP-only providers that were not hospitals (see Figure 33). In total, the 295 providers received $6.2 billion DSRIP payments between DY2 to DY4. The majority of the funds, $3.95 billion (64%) went to hospitals, while the remaining $2.24 went to other types of providers such as physician practices, health departments, and community mental health centers. During the same period, there was a total of $13.08 billion in UC payments (see Figure 34).
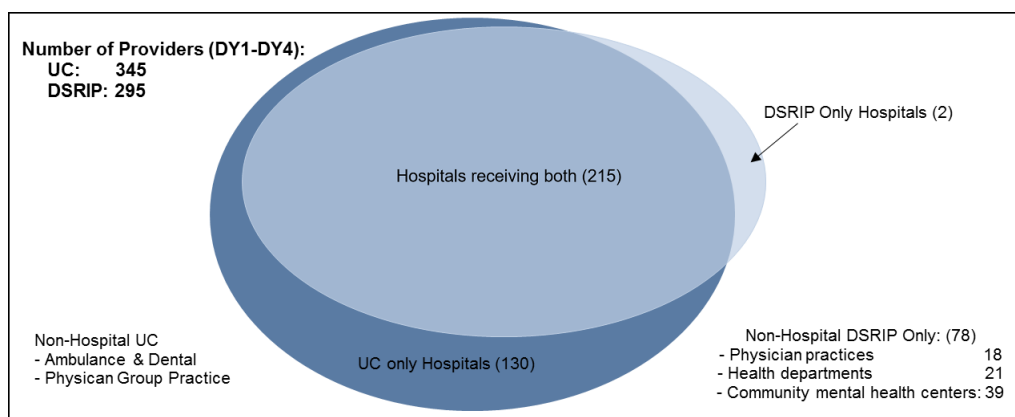

Number of Providers (DY1-DY4):
UC: 345
DSRIP: 295

Hospitals receiving both (215)

DSRIP Only Hospitals (2)

Non-Hospital UC
- Ambulance & Dental
- Physican Group Practice

UC only Hospitals (130)

Non-Hospital DSRIP Only: (78)
- Physician practices 18
- Health departments 21
- Community mental health centers: 39

Figure 33. Number of Providers Participating in UC and DSRIP Pools

Total Payments (DY2-DY4):
UC: $13.08 B
DSRIP: $ 6.20 B

Total Hospital
UC: $12.81 B
DSRIP: $ 3.95 B

Total Non-Hospital
UC: $ 0.27 B
DSRIP: $ 2.24 B

Hospitals receiving both:
UC Payments: $8.10 B
DSRIP Paymetns: $3.86 B

DSRIP Only Hospitals: $0.09 B

Non-Hospital UC: $0.27 B
- Ambulance & Dental
- Physican Group Practice

UC only Hospitals:
UC payments: $4.71 B

Non-Hospital DSRIP Only: $2.24B
- Physician practices $0.95 B
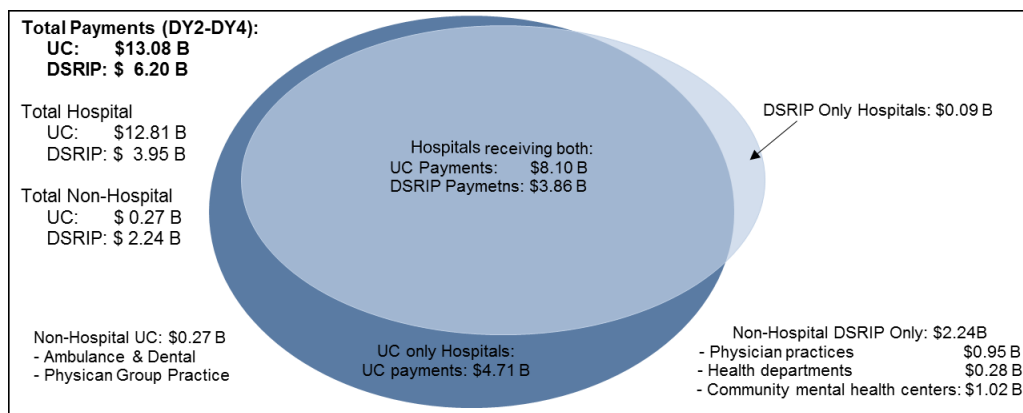- Health departments $0.28 B
- Community mental health centers: $1.02 B

Figure 34. Amount of Payments from UC and DSRIP Pools

A total of 1,488 DSRIP projects received a total of $6.2 billion DSRIP payments between DY2 to DY4 (HHSC, 2016b). Major project areas were behavioral healthcare (22%), primary care (21%), specialty care (14%), general access to care (5%), care navigation (20%), chronic disease management (4%) and health promotion and disease prevention (7%). Other program areas, such as "redesign of cost containment" made up the last 7% of the total dollars spent in DSRIP (see Figure 35 and Figure 36). The impact of these programs and payments on UC costs in Texas cannot be determined at this time.
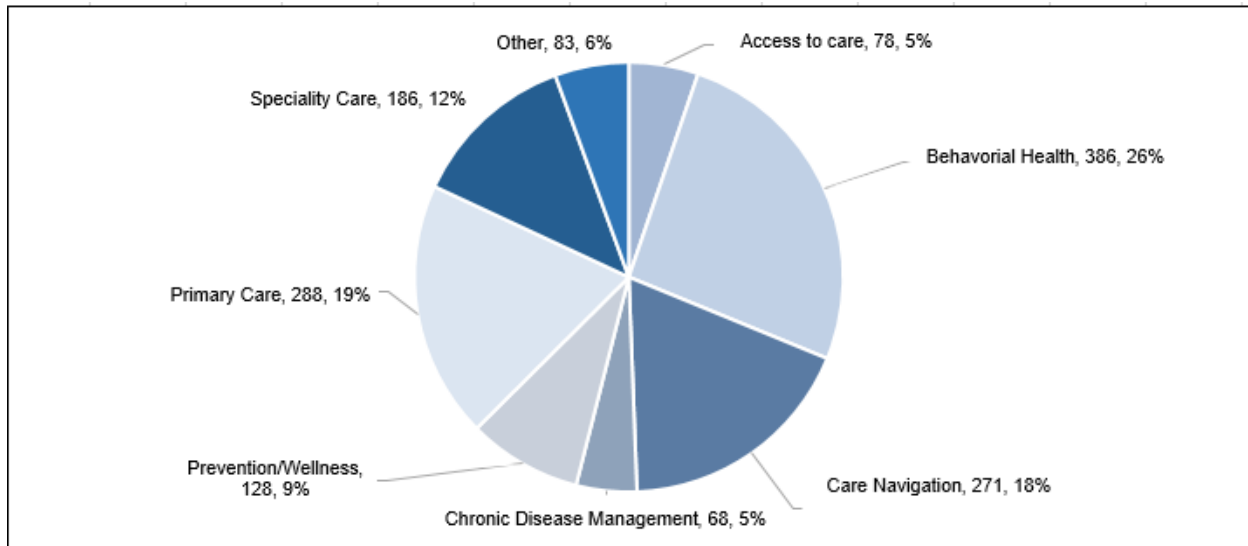

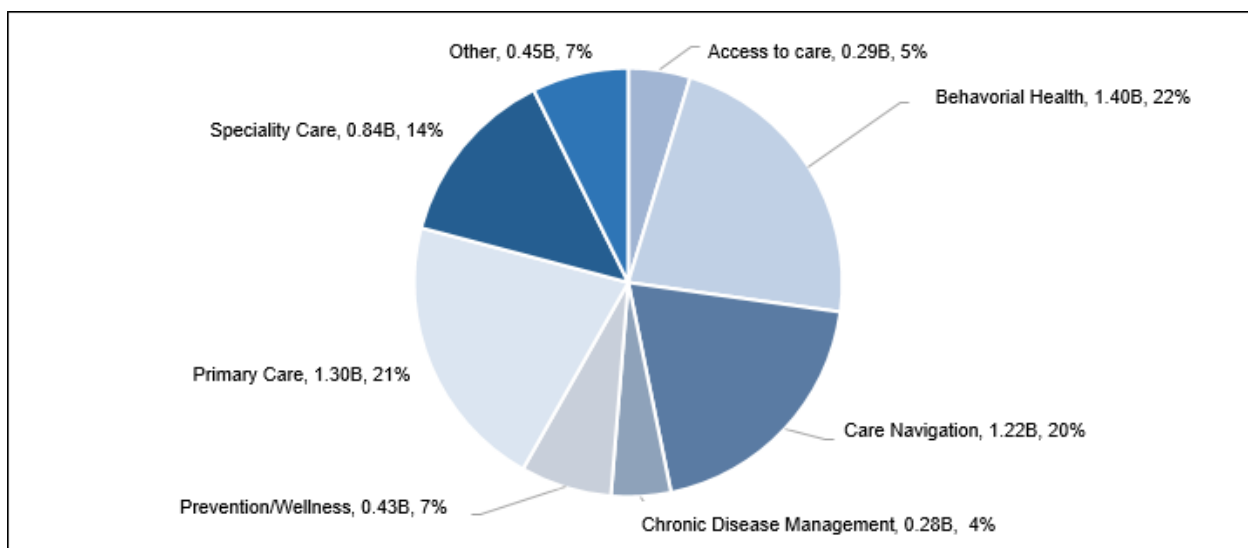
Figure 35. Number of DSRIP Projects by Project Type

Figure 36. DSRIP Payments by Project Type ($6.20 B)

STAKEHOLDER PERCEPTIONS

A total of 301 organizational respondents were asked about their familiarity with changes to the Uncompensated Care program brought about by the Demonstration. Of those, 200 (66%) indicated they were familiar with the changes. Of those familiar with the changes, 174 completed a question asking about how the UC changes have impacted access to care.

Sixty-five percent of the 174 respondents who completed a question asking about how changes to UC payments have impacted access to care indicated that they felt the changes had improved access to care. Another 26% felt that the changes had had no meaningful impact on access to care, while 9% thought the changes had reduced access to care. Twenty-six respondents that said they were familiar with the UC changes did not respond to the question about impact on access and, therefore, are not included in these analyses. Figure 37 summarizes responses to this question.
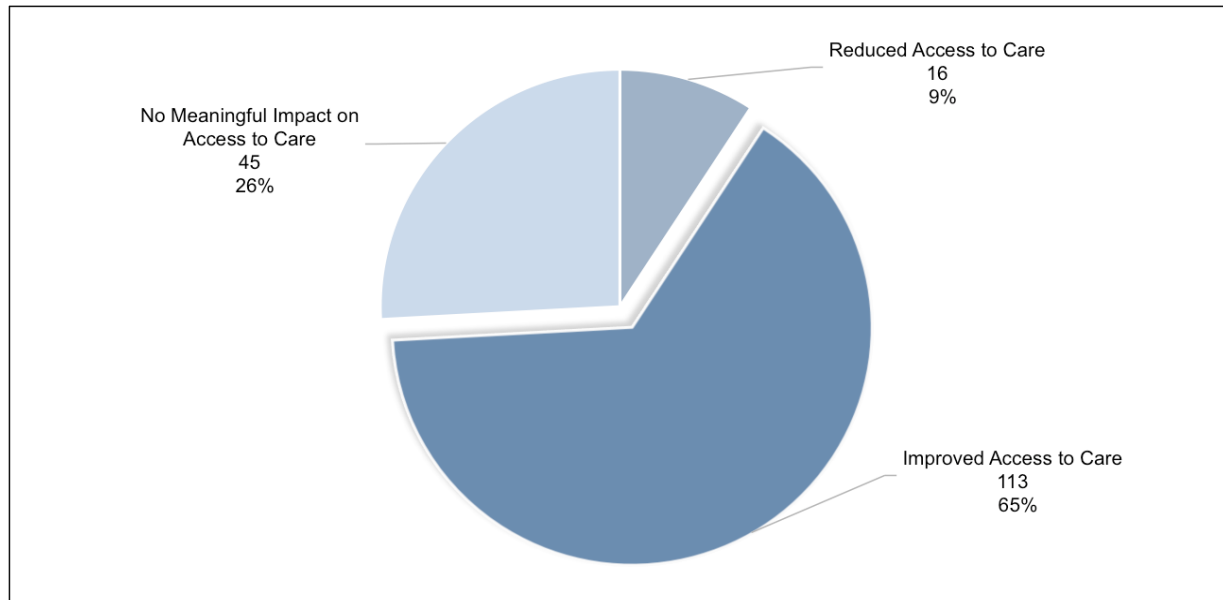

Figure 37. Stakeholder Perspectives on the Impact of UC Payment Changes on Access to Care

There was some variation in responses across RHPs (see Table 6). Several RHPs had a higher percentage of respondents that indicated the UC changes had reduced access to care, while others had a larger proportion reporting that there was no meaningful impact on access. These results, while potentially revealing, should be interpreted with caution given the small sample sizes at the RHP-level that are sensitive to outlying observations.

Table 6. Impact of Uncompensated Care Payment Changes on Access to Care, Stakeholder Perspectives by RHP

RHP	Reduced Access to Care Frequency (Percent)	Improved Access to Care Frequency (Percent)	No Meaningful Impact on Access to Care Frequency (Percent)	Total
1	1 (6%)	7 (39%)	10 (56%)	18
2	0 (0%)	4 (67%)	2 (33%)	6
3	2 (3%)	9 (60%)	4 (27%)	15
4	0 (0%)	9 (82%)	2 (18%)	11
5	0 (0%)	2 (100%)	0 (0%)	2
6	2 (40%)	3 (60%)	0 (0%)	5
7	0 (0%)	0 (0%)	1 (100%)	1
8	0 (0%)	4 (100%)	0 (0%)	4
9	0 (0%)	9 (60%)	6 (40%)	15
10	1 (5%)	15 (75%)	4 (20%)	20
11	2 (33%)	2 (33%)	2 (33%)	6
12	2 (11%)	14 (74%)	3 (16%)	19
13	2 (18%)	6 (55%)	3 (27%)	11
14	1 (13%)	4 (50%)	3 (38%)	8
15	3 (60%)	2 (40%)	0 (0%)	5
16	0 (0%)	4 (100%)	0 (0%)	4
17	0 (0%)	7 (88%)	1 (13%)	8
18	0 (0%)	3 (75%)	1 (25%)	4
19	0 (0%)	6 (67%)	3 (33%)	9
20	0 (0%)	3 (100%)	0 (0%)	3
Total	**16 (9%)**	**113 (65%)**	**45 (26%)**	**174**

Respondents who offered additional context for their responses gave valuable insight into the changes they observed in access to care brought about by the UC payment changes. Among those who felt the changes had improved access to care, respondents noted that the UC program provided help for patients generally and, more specifically, had expanded or enhanced the capacity of providers to serve patients in Texas communities. Several specifically noted that the changes in UC payment have allowed hospitals to focus on DSRIP activities. One respondent stated:

> As compared to before, there's higher funding in that area [UC] and it's helped to support our [DSRIP] project to recruit more physicians to our community, develop our new clinic, expanded hours, recruit mid-levels (e.g. nurse practitioners or physician assistants)

One rural respondent noted the impact of UC in rural communities:

> Without UC, it is difficult for rural hospitals to provide physician services in ER and we have to keep that open. That money has helped to keep providers in ER to provide services to clients.

Other respondents took note of how the UC payment changes have improved funding at the organizational level, allowing for hospital and physician providers to still treat patients in need of services.

> In [South Texas Community] we have 40% of the people who are transient or have no insurance. This program is a way for hospitals to get back some of the money and carry on seeing patients who are unable to pay.

> Providers can now "afford" to see indigent patients more than before.

Respondents that indicated they felt the UC payment changes had reduced access to care perceived two particular areas that have been impacted—service delivery and provider options. In terms of service delivery, respondents mentioned the decrease in UC payments over the Demonstration period, and resulting shift to DSRIP, and a related reduction in the services providers are able to offer. For example, one survey participant said:

> We still have a lot of uninsured people, DSRIP focuses on specific projects but may or may not apply to the general needs of every uninsured person. As uncompensated care reduces, hospitals are challenged financially to still serve patients.

With regard to provider options, several respondents had observed a reduction in the number of providers in their community accepting patients with public coverage such as Medicaid. Others identified difficulties recruiting providers to their community because of financial constraints.

Among respondents noting no meaningful change in access to care, most cited that the program was not really different than the Upper Payment Limit program that existed prior to the Program.

> UC replaced Upper Payment Limit, so it did not change anything— essentially, UC replaced one funding stream with another, but it is essential to the inpatient delivery system.

Others remarked that while there were Program changes, it did not make a difference for their organization's approach to treating underserved populations.

> For us, it does not matter because we are in a community where they will be seen regardless of whether or not UC exists, particularly because we are a county hospital.

> We provide services to patients regardless of their ability to pay, so it did not change anything.

CONCLUSIONS

Although there are differences between this final evaluation report and the Health Management Associates (HMA) UC report (HMA, 2016) submitted to HHSC (See Table 6), both reports arrive at similar conclusions. The detailed analysis of the UC data presented in this appendix support our main finding that hospitals that provide uncompensated care in Texas are under growing

financial stress. As noted in the Executive Summary, as of FY2015, the UC pool supplemental payments covered only 50% of the estimated shortfall after DSH payments, with $2.8 billion remaining; accounting for number of beds, public hospitals represented 55% of UC payments per bed and 52% of total shortfall after all payments per bed. The UC cost covered by the UC pool payments for these hospitals dropped from 84% to 52% during the Demonstration indicating the growing financial stress on hospitals that provide substantial uncompensated care. During this time 295 providers earned $6.2 billion DSRIP payments to implement a total of 1,488 DSRIP projects. Unfortunately, due to the combination of delays in DSRIP project implementation and a 2-year lag inherent in UC cost reporting, data were not available to observe trends in UC costs over the entire Demonstration period or to evaluate the impact of provider-earned DSRIP funds. In addition, DSRIP projects are not fully evaluated against metrics at this time and incentive payments are not fully made yet. Incentive payment can be delayed for up to three reporting periods after the project is approved and enacted. Thus, no causal inferences can be made at this point about the impact of the Demonstration on UC costs. Hence, HHSC needs more time to conduct an updated analysis with more follow-up data.

Table 7. Comparison with HMA Report

Measure	Demonstration Evaluation Report (i.e., this report)	HMA Texas UC Report (HMA, 2016)
Data Sources	• Texas hospital DSH/UC application 2012-2015 data for costs incurred in 2010-2013, for payments in 2012-2015 • AHA Survey Data 2010-2015 • DSRIP data 2013-2015 (DY2-DY4) • All costs and payments amounts were adjusted to 2012 constant dollars using CPI	• Same Texas data (Texas hospital DSH/UC application data) • 2013 data trended to 2015 for cost and payment calculations • DSRIP data 2013 (DY2) only • Not inflation adjusted
UC Cost Definition	UC Cost = Medicaid shortfall + uninsured shortfall + related hospital-affiliated physician, mid-level, and pharmacy services shortfall.	UC Cost = Medicaid shortfall + uninsured shortfall
Goals	• To determine whether the two new funding pools, UC and DSRIP payment pools, were effective in assisting Texas hospitals with their UC costs, this evaluation assessed whether any changes in UC costs were attributable to the DSRIP Demonstration interventions • To determine the percentage of providers' UC cost made up by payments from the UC pool (STC)	• Prepare a detailed description of the composition of current Medicaid hospital payments • Provide an analysis of Medicaid financing and how the non-federal match is funded • Estimate the cost incurred by hospitals to provide services to Medicaid beneficiaries and compare the cost to the corresponding payments received. • Estimate the cost of uncompensated care provided by hospitals and the portion of uncompensated care attributed to charity care. • Analyze the adequacy of Medicaid payments in relation to cost incurred by hospitals. • Analyze how Texas Medicaid compares to other states in terms of payment adequacy. • Assess recent economic and environmental trends within Texas that may impact future reimbursement levels and the cost of caring for low-income populations. • Estimate the financial effects under different scenarios

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APPENDIX G: APPROVED EVALUATION PLAN

Texas Healthcare Transformation and Quality Improvement Program Demonstration Waiver

Evaluation Plan

Texas Health and Human Services Commission
Strategic Decision Support
November 16, 2012

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EVALUATION PURPOSE

The Texas Healthcare Transformation and Quality Improvement Program (Program) is a Section 1115(a) waiver demonstration approved by the U. S. Department of Health and Human Services Centers for Medicare and Medicaid Services (CMS) on December 12, 2011. The Demonstration started December 12, 2011 and will end September 30, 2016. The Texas Health and Human Services Commission (HHSC) Medicaid/CHIP Division is managing the implementation and oversight of the Program.

The overarching goal of the Program is to support the development and maintenance of a coordinated care delivery system, thereby maintaining or improving health outcomes while containing cost growth. The Program strategy uses **two types of interventions** to achieve the overarching goal:

1) expanding the existing Medicaid managed care programs, STAR and STAR+PLUS, statewide, creating a new children's dental program, while carving-in prescription drug benefits; and

2) establishing two funding pools that will assist providers with uncompensated care costs and promote health system transformation.

The Program evaluation will examine the implementation and impact of the two Program interventions through a set of quarterly and annual performance measures throughout the demonstration period (December 12, 2011 through September 30, 2016). The principal focus of the demonstration evaluation will be on obtaining and monitoring data on performance measures for short-term (process measures) and intermediate (health outcomes) of the Program. The performance measures will be used to assess the extent to which the Program accomplishes its goals, track changes from year to year, and identify opportunities for improvement.

DESCRIPTION OF DEMONSTRATION EVALUATION

The following section provides a general description and evaluation goals for the two Program interventions. However, detailed information regarding Program description can be found in the 1115 Waiver.[16]

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[16] http://www.hhsc.state.tx.us/Waiver-1115-proposal.pdf. Last accessed November 5, 2012.

Intervention 1: Expansion of Medicaid Managed Care Program Statewide

The first intervention relates to the expansion of the Medicaid Managed Care program statewide. Expansion activities include:

- Expand risk-based managed care delivery system (STAR and/or STAR+PLUS) statewide replacing the primary care case management (PCCM) or fee-for-service (FFS) delivery systems.
- Replace the FFS delivery model for delivering primary and preventive dental care with a managed care model (children's Medicaid dental services).
- Prescription drug benefits, previously provided under the FFS program, will be carved into managed care benefit and capitation rates.

STAR provides services in a managed care delivery system and focuses on acute care and early prevention. Through the waiver, STAR expanded to two new service delivery areas (SDAs). The Hidalgo SDA includes 10 counties in South Texas and has a confirmed total enrollment of 319,763.[17] The Medicaid Rural Service Area (MRSA) includes 164 counties and has a confirmed enrollment of 419,430.[18] The STAR+PLUS program integrates acute care and long-term care services and supports into a Medicaid Managed Care delivery system for people over the age of 65 years, who are blind, or who have disabilities. STAR+PLUS expands to SDAs in Lubbock (11,309 confirmed total enrollment) and El Paso (24,137 confirmed total enrollment) and a new Hidalgo (74,171 confirmed total enrollment) service area. The newly created STAR and STAR+PLUS SDAs will be the primary focus of this evaluation. As members shift from PCCM or FFS to a capitated managed care system it creates an ideal situation to examine the impact of managed care expansion on access to care, coordination of care, quality of care, and cost.

Impact of Managed Care Expansion

The evaluation goals under this domain relate to the impact of managed care expansion on access to care, coordination of care, quality of care, efficiency of care, and cost of care.

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[17] All enrollment data is from Texas Enrollment Broker Confirmed Eligibles Report for October 2012. Accessed at http://www.hhsc.state.tx.us/medicaid/mc/about/reports/confirmed_eligible/201209.pdf
[18] All enrollment data is from Texas Enrollment Broker Confirmed Eligibles Report for October 2012. Accessed at http://www.hhsc.state.tx.us/medicaid/mc/about/reports/confirmed_eligible/201209.pdf

- **Evaluation Goal 1:** Evaluate the extent to which *access to care* improved through managed care expansion to new STAR and STAR+PLUS SDAs.

  - Program focus goals include, but are not limited to, access to prescription drugs, dental care for children, non-behavioral inpatient care, adult access to preventative/ambulatory health service, and prenatal and postpartum care (PPC).

- **Evaluation Goal 2:** Evaluate the extent to which *coordination of care* improved through managed care expansion to new STAR and STAR+PLUS SDAs.

  - Program focus goals include, but are not limited to, coordination of care among providers and service coordination.

- **Evaluation Goal 3:** Evaluate the extent to which *quality of care* improved through managed care expansion to new STAR and STAR+PLUS SDAs, Dental Services, and Pharmacy Services.

  - Program focus goals include, but are not limited to, quality of dental care for children, effects of automatic re-enrollment after disenrollment, and quality of adult preventive and emergent care.

- **Evaluation Goal 4:** Evaluate the extent to which *efficiency improved and cost decreased* through managed care expansion to new STAR and STAR+PLUS SDAs, and Dental Services.

  - Program focus goals include, but are not limited to, reduction of member costs, increased utilization rates, and an analysis of the experience rebate provision.

Intervention 2: Formation of Regional Healthcare Partnership (RHP) Regions

CMS requires a state seeking a Section 1115 waiver to establish that federal expenditures will not be greater than they would be under the state plan. To meet that requirement, the Program calculated the projected savings from the expansion of managed care and the amount of hospital funding historically received as Upper Payment Limit (UPL) payments, which together establish the maximum amount of funding available to pay providers through the waiver. That amount was allocated to two new funding pools. The Uncompensated Care (UC) and Delivery System Reform Incentive Payment (DSRIP) pools aim to assist hospitals and other providers with uncompensated care costs and to promote health system transformation in preparation for new coverage demands beginning in 2014. To receive payments from either funding pool, a hospital must join with other hospitals or public entities in a geographic region to form Regional Healthcare Partnerships (RHP). Each RHP, with the collaboration of participating providers, will identify performance areas for improvement and create a plan under which its members will implement approved projects to achieve waiver goals. Projects eligible for incentive payments must come from a menu of projects approved by CMS and HHSC, and have corresponding

metrics and milestones.[19] The lessons learned from the development of these sustainable networks of hospitals and providers are of particular interest.

Uncompensated Care Costs

The evaluation goal under this domain relates to examining the distribution of uncompensated care funds to hospitals and other provider types.

The UC pool is designed to help defray uncompensated costs of care provided for Medicaid or Demonstration eligibles or to individuals who have no source of third party coverage for the services provided by hospitals or other providers. To receive payments from the UC pool, a hospital must complete an application listing its uncompensated costs for services provided to Medicaid and uninsured individuals. A hospital may claim uncompensated costs for inpatient and outpatient services, as well as related costs for physician, clinic, and pharmacy services. While it is not expected that the need for UC funds will decrease, it is expected that as the health system transforms due to the DSRIP projects, the rate at which the need grows will slow due to the improved services and supports.

- **Evaluation Goal 5:** Evaluate whether the amount of claims for uncompensated costs, based on service type, remains stable or decreases over time for hospitals participating in the waiver.

Delivery System Reform Incentive Payment Pool

The evaluation goals under this domain relate to the ability of the RHPs to show, through the utilization of DSRIP funds, quantifiable improvements relating to quality of care, population health, and cost of care. The goals also relate to the increased collaboration among health care organizations and stakeholders in each region due to the establishment of the RHPs.

The DSRIP pool is designed to incentivize activities that support a region's collaborative efforts to improve access to care, the quality of care, and improve the health of the patients and families they serve. To receive payments from the DSRIP pool, a hospital must meet specific metrics for each project selected by the RHP members and detailed in the plan. Projects using funds from the DSRIP pool must be directed toward activities which are divided into four interrelated and complementary categories: infrastructure development, program innovation and redesign, quality improvements, or population-focused improvements.

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[19] For more information on the menu of approved project types, and the metrics and milestones see: http://www.hhsc.state.tx.us/1115-Waiver-Guideline.shtml.

- **Evaluation Goal 6:** Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted the quality of care.

- **Evaluation Goal 7:** Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted the health of the population served.

- **Evaluation Goal 8:** Evaluate the extent to which, through the implementation of DSRIP projects, RHPs impacted the cost of care.

- **Evaluation Goal 9:** Evaluate the extent to which the establishment of RHPs increased collaboration among health care organizations and stakeholders in each region.

Stakeholder Input

The evaluation goals under this domain relate to stakeholder perceptions of the expanded managed care program, the UC pool, and the DSRIP pool. Stakeholders will include individuals and families, advocacy groups, providers, health plans, and hospital administrators.

- **Evaluation Goal 10:** Assess stakeholder-perceived strengths and weaknesses, and successes and challenges of the expanded managed care program, the UC pool, and the DSRIP pool to improve operations and outcomes.

- **Evaluation Goal 11:** Assess stakeholder-recommended changes to the expanded managed care program, the UC pool, and the DSRIP pool to improve operations and outcomes.

EVALUATION DESIGN

Given that there are two interventions in the Demonstration, there will be two program evaluations. The evaluation design for assessing overall programmatic impact associated with implementation of the Waiver is described using two logic models (see Figures 1 and 2). These program logic models describe the organization and explanation for the program evaluations. Fundamentally, the logic models assisted evaluators in narrowing the focus of the evaluation to questions that demonstrate whether or not the process of program expansion was successful, whether there was an impact on maintaining or improving the health status of Texas Medicaid Managed Care members while containing cost growth, and whether the establishment of the two funding pools promote health system transformation.

A research design was selected for each of the interventions to provide the best available information and cost-effectively address the evaluation questions. Each intervention is described with a logic model which describes how the Program is expected to change healthcare delivery in the short- and intermediate-term. Each logic model links the federal, state, and local stakeholders involved, process indicators (which may include Program or organizational changes) and how changes may influence intermediate health outcomes. The next sections align the two logic models with metrics and methodology used for analyses.

Intervention 1: Expansion of Medicaid Managed Care Program Statewide (Evaluation Goals 1 – 4)

Given the Program expansion activities described in the program description, the evaluation will include measures on short-term outcomes (process indicators), intermediate outcomes (health outcome indicators), and cost outcome indicators (see Figure 1). Process indicators will include measures of care coordination, member satisfaction, and preventive care-specific clinical processes shown to be associated with favorable clinical outcomes. Health outcome measures will include measures of clinical outcomes that are associated with process indicators. Finally, cost outcome indicators associated with process and health outcome indicators will be examined for any changes due to process or health outcome measures.

Over the five-year demonstration period (DP), measures on process (short-term), health outcome indicators (intermediate), and cost outcome indicators will be reported quarterly and in the interim and final evaluation reports. However, Texas anticipates that changes will first be observed in process outcomes and then in intermediate outcomes in later demonstration years. By monitoring process outcomes, we expect to reduce the likelihood of false negative results due to time period for detecting any health outcome being too short.

Even though the overarching long-term impact is to maintain or improve health outcomes while containing cost growth, Texas will focus on evaluating each process and associated health outcome. The advantage of this strategy enables Texas and CMS to examine differences among specific health benefits (e.g., prescription drugs) in order to identify which benefit may be making the greatest positive impact and which health benefit deserves improvement.

Trend Analysis

A pre- and post- expansion design will be developed to evaluate the expansion of Medicaid Managed Care program into the new SDAs due to concerns over establishing adequate comparison group(s). A pre- and post- intervention design will involve collecting information only on the expanded service areas (Hidalgo, El Paso, Lubbock, and MRSA) and may include analysis at the member, county, managed care organization (MCO), or SDA-level. Data will be collected at least twice:

- Before expansion – data collected once before the expansion (or intervention) will provide baseline data. Baseline data is ideally defined as data 3-years prior to expansion (under FFS system or PCCM).

- After expansion – depending on the performance measure/indicator, data may be collected quarterly, annually, or on specific demonstration years.

Unless specified, data will be collected to monitor and track process (short-term) outcomes and health outcomes indicators (intermediate outcomes) over the demonstration period. However, it is important to note that a trend analysis does not provide direct evidence that would allow program officials or policy makers to attribute any specific changes to the Program. Because trend analysis uses cross-sectional data, it does not provide strong evidence for cause and effect. Any findings may be limited to associations only.

Additional Analyses

For each health outcome (intermediate outcome) benefit, the evaluation will examine the relationship between process indicators (short-term outcomes) and health outcome (intermediate outcomes). Depending on how the performance measure is measured (i.e., nominal, ordinal, or interval) and the unit of analysis (i.e., member, counter, MCO, or SDA-level), contingency tables (case-control) will be described.

Figure 1. Logic Model for the Medicaid Managed Care Expansion Intervention

1115 Texas Waiver Evaluation Logic Model
(Medicaid Managed Care Expansion)
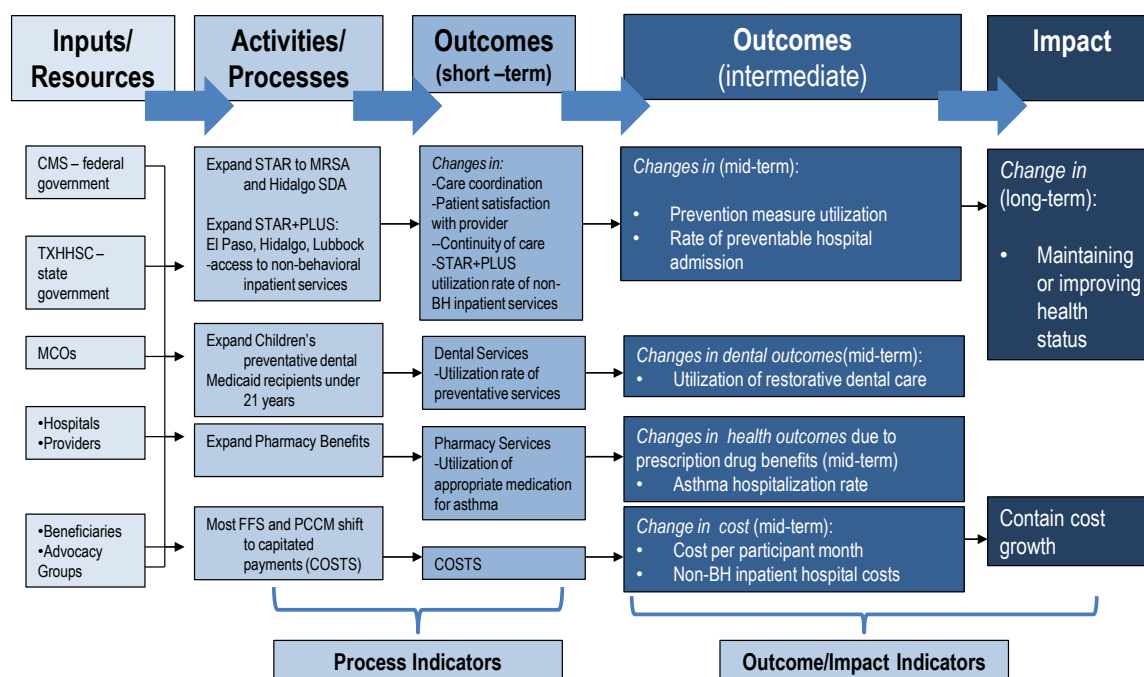
Data Collection

For the first intervention, information is provided on data sources, how these data are to be used, and the methods related to the evaluation questions. The data collected to examine the impact of the Medicaid Managed Care program expansion statewide come from three basic sources. This section describes the data sources used to evaluate the first intervention. After the data sources have been described, each evaluation question will be addressed along with related hypothesis and any additional analyses not previously mentioned.

1. <u>Health Employer Data and Information Set (HEDIS)</u>® was adopted by the National Committee for Quality Assurance (NCQA) as a standard of performance measures used by more than 90 percent of national health plans. Participation in HEDIS® is required for plans seeking NCQA accreditation and most managed care plans allow NCQA to publish their annual HEDIS® data publicly. HEDIS® measures focus on preventative and primary care services for defined populations of health plan enrollees. While HEDIS® measures may be interpreted as measures of managed care performance, there are a few measures that reflect the performance of hospital or multi-hospital systems.

- Three data sources were used to calculate the HEDIS quality of care indicators:

    o **Member-level enrollment files** - The enrollment files contain information about the person's age, gender, the MCO in which the member is enrolled, and the number of months the member has been enrolled in the program.

    o **Member-level health care claims/encounter data** - The member-level claims/encounter data contain the Current Procedural Terminology (CPT) codes, and International Classification of Diseases, 9th Revision (ICD-9-CM) codes, place of service (POS) codes, and other information necessary to calculate the quality of care indicators. There is a six-month time lag for claims and encounter data. Prior analyses with Texas data have shown that, on average, over 96 percent of claims and encounters are complete by that time period.

    o **Member-level pharmacy data** - The member-level pharmacy data contain information about filled prescriptions, including the drug name, dose, date filled, number of days prescribed, and refill information.

2. <u>Consumer Assessment of Health Plans Survey (CAHPS)</u>® was developed by the Agency for Healthcare Research and Quality (AHRQ) to standardize patient surveys that can be used to compare results across sponsors over time. CAHPS® surveys ask patients to report on their experiences with a range of health care services at multiple levels of the delivery system.

    o Texas CAHPS® participants are selected from a random sample of members and stratified by health plan. To be eligible for survey participation, member must have been enrolled in STAR or STAR+PLUS program for nine months or longer. Members who are eligible for both Medicaid and Medicare, and members who participated in the previous fiscal years' survey are excluded. Since October 1995, Texas has been

contracting with an External Quality Review Organization (EQRO), the University of Florida, Institute for Child Health Policy to implement and report on CAHPS® data. Each year, a target total of survey participants is established and contacted by telephone.

3. <u>Managed Care and Fee-for-Service Encounter Data</u> FFS and Managed Care encounter data have been processed by the Texas Medicaid and Healthcare Partnership (TMHP) since January 1, 2004. TMHP (headed by contractor Xerox State Health Services) performs internal edits for data quality and completeness. There is a six-month time lag for claims and encounter data. Prior analyses with Texas data showed that, on average, over 96 percent of the claims and encounters are complete by that time period.

Evaluation Questions

The evaluation questions are broken down into three evaluation measurement types: Process indicators (short-term), health outcome indicators (intermediate), and cost outcome indicators. Table 1 presents a summary of each evaluation question including the performance measure/indicator, the data source, anticipated outcome, and deliverable timeline.

Process Indicators

Evaluation questions specifically having to do with process indicators are described below.

1. Did expansion of STAR to the Hidalgo SDA and STAR+PLUS to the El Paso, Hidalgo, and Lubbock SDAs impact access to care for the target population? (STC 68.a.i)

   o ***Adult access to preventive/ambulatory health services.*** As Medicaid managed care is expanded through the STAR and STAR+PLUS delivery systems, the number of preventive or ambulatory care visits by plan members will be measured and monitored. As members formerly receiving benefits under FFS or PCCM move into STAR or STAR+PLUS, it is expected that the number of members who receive preventive or ambulatory health services will increase.

     Methods. HEDIS® measures will be obtained annually by MCO and SDA over the demonstration years and compared to baseline years.

2. What was the impact (access, quality of care, and program costs) of including non-behavioral hospital inpatient services in the STAR+PLUS program? (STC 68.a.i.E)

   o ***Number of STAR+PLUS members who had inpatient hospital stays.*** The carve-in of non-behavioral health inpatient services to the STAR+PLUS managed care benefit program will enable members to have covered access to non-behavioral health inpatient services through the capitated system rather than through a FFS system. Access to inpatient services will be measured by monitoring the rate of inpatient hospitalizations over the demonstration period for STAR+PLUS members in El Paso, Hidalgo, and Lubbock SDAs.

     Methods. Managed Care and FFS claims and encounter data will be used to determine the number of STAR+PLUS members who had inpatient hospital stays in a

demonstration year per 1,000 members. The data will be reported by MCO and SDA over the demonstration years and compared to baseline years.

o **Services utilized during hospitalizations.** Services utilized during hospitalizations potentially indicate the quality of healthcare received. If top procedures performed include a high number of potentially avoidable conditions, this may indicate deficiencies in the quality of care.

  Methods. Managed Care and FFS claims and encounter data will be used to determine the top ten procedures performed on inpatient admissions and will be monitored and compared to baseline years and AHRQ national rates. These rates will be reported by MCO and SDA over demonstration years and compared to baseline years.

o **Average number of miles from STAR+PLUS members to closest participating inpatient hospital in each new service area.** The expectation is that that members will continue to have similar access to inpatient services as before the expansion.

  Methods. A distance analysis of inpatient hospitals participating in STAR+PLUS programs will be compared with a distance analysis of hospitals that submitted claims under the FFS and PCCM systems in the three years prior to expansion of managed care for each new SDA. These rates will be reported by MCO and SDA over the demonstration years and compared to baseline years.

o **Program financing.** It is expected that the average cost of hospitalizations for STAR+PLUS members in El Paso, Hidalgo, and Lubbock SDAs will be less than the average cost of hospitalizations in the same service areas prior to the expansion (under FFS).

  Methods. Managed Care and Fee-for-Service Encounter Data will be used to determine the average cost of hospitalization for STAR+PLUS members who had inpatient hospital stays in a demonstration year compared to the baseline years. The data will be reported by MCO and SDA over the demonstration years and compared to baseline years.

3. Has the utilization of preventative (and care coordination) of dental services for children age 20 years and younger changed as a result of the expansion? (STC 68.a.i.B)

  o **Participating children's access to dental services.** As children's dental care benefits are expanded through a capitated statewide dental services model (children's Medicaid dental services), access to dental care for plan members will be measured and monitored over the demonstration period.

  Methods. Unduplicated counts of members and those receiving services will be obtained from Children's Medicaid dental services enrollment database and monthly Medicaid encounters data. The data will be compared with results for the same age children from the national data from National Survey of Children's Health and EPSDT FFS results from baseline years.

o *Participating children's use of recommended preventive dental services.* As children's dental care benefits are expanded through capitated statewide dental services (children's Medicaid dental services), use of recommended preventive dental services will be measured and monitored over the demonstration period.

Methods. Recommended dental preventative services are based on the American Academy of Pediatric Dentistry and beginning at one year old include: 1) two dental check-ups in one calendar year, 2) receiving at least one fluoride treatment or dental cleaning in one calendar year, and 3) receiving at least one diagnostic dental service in one calendar year. Seven age cohorts will be constructed: 1) members < 1 year old; 2) members 1 to 2 years old; 3) members 3 to 5 years old; 4) members 6 to 9 years old; 5) members 10 to 14 years old; 6) members 15 to 18 years old; and 7) members 19 to 20 years old. These seven age cohorts are based on EPSDT age breakdowns and allow adequate pre- and post- expansion comparisons to baseline data.

4. Has the carve-in of pharmacy benefits into capitated managed care impacted access to care for the target population? (STC 68.a.i.A)

   o *Access to prescription drug benefits.* As prescription drug benefits are carved-in to the capitated managed care benefits program, access to pharmacy benefits for plan members will be measured and monitored. Texas intends to examine access to prescription drugs for members with specific chronic health conditions.

   Methods. Texas will identify members in select counties with prescriptions for asthma by using the NCQA list of appropriate medications for people with asthma. Access to pharmacy benefits will be measured as follows.

      i. Monitor and track stratified by age.
      ii. Use of appropriate medication for people with asthma (all ages).
      iii. *Limitations*: Although Texas will be tracking whether members received prescribed medications, we cannot know if members filled all recommended prescriptions from their physicians, or are using medications appropriately or at all. There might also be other environmental factors (potential confounders) that we cannot control for in any potential multivariate statistics.

5. Did expansion of STAR and STAR+PLUS to new service delivery areas impact care coordination for the target population? (STC 68.a.i)

   o *Percent of STAR or STAR+PLUS members in each new service area who felt their doctor was informed about the care they received from other providers.* The expectation is that the number of managed care members who report that their doctor was informed about the care they received from other providers will remain stable or increase.

> **Methods.** Data will be obtained from the annual member CAHPS® survey and information will be compared to pre-demonstration baseline years to capture any changes by service area results for clients receiving benefits under FFS or PCCM.

6. Did automatic re-enrollment after disenrollment for STAR, STAR+PLUS, and children's Medicaid dental services improve continuity of care for the target population? (STC 68.a.i.C)

   o **_Automatic re-enrollment after disenrollment._** In order to improve continuity of care, STAR, STAR+PLUS, and children's Medicaid dental services members will be automatically reenrolled in their previous health plan after a period of ineligibility. Texas already has an auto-assignment algorithm for enrollment and disenrollment through the Enrollment Broker, MAXIMUS. Enrollees who do not select a plan within a specified period are auto-assigned with an MCO. Generally, the auto-assignment process considers an enrollee's history with a primary care provider or main dental provider in making an assignment. Measures of quality will focus on member satisfaction of their health care plan after they have been automatically reenrolled.

   > **Methods.** Data will be obtained from MAXIMUS for at least one demonstration year. During one demonstration year, the number of members who requested a change to another MCO will be identified and stratified into three groups, 1) members who are newly enrolled, 2) members who automatically reenrolled after a lapse of less than three months, and 3) members who automatically reenrolled after a lapse of three months or more. For each group, data may be obtained on the frequency of MCO reassignment requests, reason(s) for request, and enrollee satisfaction. Depending on the availability of data, Texas anticipates examining any differences for each measure among the groups by using ANOVA unbalanced design (for quantitative outcomes, such as frequency of MCO reassignment requests) and chi-square contingency tables for nominal/ordinal outcomes, such as reason(s) for request and enrollee satisfaction.

Intermediate Health Outcome Indicators

Evaluation questions specifically having to do with health outcome indicators are described below. (STC 68.a.i.)

1. Did the expansion of STAR and STAR+PLUS to the new SDAs reduce preventable ER visits and hospitalizations over the demonstration period for the target population?

   Three measures will be monitored and tracked over the demonstration period for STAR and STAR+PLUS members in El Paso, Hidalgo, and Lubbock SDAs to determine whether access, quality of care, and care coordination is associated with reductions in potentially preventable emergency department and hospital admissions and readmissions. For this indicator, improved quality is shown by a decreasing trend of admission rates over the demonstration period.

The movement of service delivery areas from FFS and PCCM into managed care is expected to improve care coordination and increase access to care by offering value-added components not available in FFS or PCCM. One aspect of quality is the prevention of visits to the emergency department and admissions to the hospital that were potentially avoidable with better access to care in the outpatient setting.[20] Potentially Preventable Events (PPEs) are inpatient stays, hospital readmissions, and emergency department (ED) visits that may have been avoidable had the patient received high quality primary and preventive care prior to or after the event in question. High PPE rates may reflect inadequacies in the health care provided to the patient in multiple settings, including inpatient and outpatient facilities and clinics.

- o ***In each new service area, the number of potentially preventable emergency department visits per 1,000 members.*** It is expected that members who receive regular preventative services through their primary care physician will show a decrease in potentially preventable emergency department visits in new managed care service areas.

    Methods. HEDIS® measures will be obtained annually by MCO and SDA over the demonstration years and compared to baseline years to determine if the rate of potentially preventable emergency department visits has decreased.

- o ***In each new service area, the number of potentially preventable hospital admissions per 1,000 members.*** It is expected that members who receive regular preventative services through their primary care physician will show a decrease in potentially preventable hospital admissions in new managed care service areas.

- o ***Methods.*** HEDIS® measures will be obtained annually by MCO and SDA over the demonstration years and compared to baseline years to determine if the rate of potentially preventable emergency department visits has decreased.

- o ***In each new service area, the number of potentially preventable readmissions per 1,000 members.*** It is expected that members who receive adequate hospital care

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[20] According to measures developed for HEDIS®, potentially preventable emergency department visits and hospitalizations may include: general fever symptoms, including high fever; general chest pain symptoms, including chest discomfort, pressure, tightness, and burning, but excluding heart pain, heart disease symptoms, congestive heart failure; symptoms of mental status changes, like mood swings, wandering around, disorientation; gastrointestinal bleeding symptoms, including conditions such as blood in stool and vomiting blood; urinary tract infections; metabolic disturbance diseases, including such conditions such as low blood sugar, hypoglycemia, and poor nutrition; pneumonia, including viral, bacterial, and broncho pneumonia; diseases of the skin, including such conditions as cellulitis, seborrheic dandruff, eczema, psoriasis, and allergic skin reactions; and injuries due to falls.

and post-hospital discharge follow-up through their physician will show fewer potentially preventable readmissions in new managed care service areas.

Methods. HEDIS® measures will be obtained annually by MCO and SDA over the demonstration years and compared to baseline years to determine if the rate of potentially preventable emergency department visits has decreased.

2. Have dental MCOs reduced restorative dental care to the target population (children) over the demonstration period? (STC 68.a.i.B)

The children's Medicaid dental services program is expected to improve quality of care for enrolled children by increasing access to regular preventive care. Preventive care is a specific clinical process that has been shown to be associated with favorable clinical outcomes. It is expected that children who receive recommended preventative dental services will show a decreased need for restorative services. Seven age cohorts will be constructed: 1) members < 1 year old; 2) members 1 to 2 years old; 3) members 3 to 5 years old; 4) members 6 to 9 years old; 5) members 10 to 14 years old; 6) members 15 to 18 years old; and 7) members 19 to 20 years old. These seven age cohorts are based on EPSDT age breakdowns and allow adequate pre- and post- expansion comparisons.

o *Number of members who received restorative dental services per 1,000 members.* It is expected that there will be an inverse relationship between members who receive regular preventive dental care and those receive restorative services. Restorative care is generally defined as the management of diseases of the teeth and supporting structures and the rehabilitation of their structure and function. Restorative treatments may include fillings, crowns, and the replacement of missing teeth.

Methods. HEDIS® measures will be obtained annually by MCO and SDA over the demonstration years and compared to baseline years to determine if the rate of restorative dental services has decreased. Additional multivariate logistical analysis could examine the relationship between members who received regular preventative dental care on the likelihood that those members received restorative services. All data will be compared to national trends for the rate of restorative dental services.

3. Has the carve-in of pharmacy benefits into STAR and STAR+PLUS reduced the number of hospital admissions due to an acute asthmatic event? (STC 68.a.i.A)

o *In each new service area, the number of asthma hospital admissions per 100,000 members.* It is expected that members who receive adequate prescription drugs for the care of this chronic illness will show fewer asthma hospital admissions.

Methods. HEDIS® measures will be obtained annually by MCO and SDA over the demonstration years and compared to baseline years to determine if the rate of asthma hospital admissions has decreased. Additional multivariate logistical analysis could examine the relationship between members who received adequate prescription drugs for the care of asthma on the likelihood that those members have an asthma-related hospital admission.

Cost Outcome Indicators

The evaluation question specifically related to cost outcome indicators is described below.

1. How does Texas' Experience Rebate provision compare to Medical Loss Ratio regulation as a strategy for ensuring that managed care plans spend an appropriate amount of their premium revenue on medical expenses? Specifically, would the MCOs return approximately the same amounts to Texas under a Medical Loss Ratio requirement as under the Experience Rebate, or would the results differ? (STC 68.a.i.D)

   o ***Amount of premium dollars returned to Texas under the Experience Rebate Provision.*** Each MCO participating in either the STAR or STAR+PLUS programs must return to the state a portion of all profits over three percent of revenue based on a sliding scale. This is known as the Experience Rebate. In addition, the state imposes an administrative expense cap on all MCOs. The experience rebate is designed to ensure that MCOs are spending in an efficient manner and that profit and administrative costs are maintained. In contrast to Texas' Experience Rebate, the Affordable Care Act requires health insurance issuers to submit data on the proportion of premium revenues spent on clinical services and quality improvement, also known as the Medical Loss Ratio.[21] If an insurance company spends less than 80 percent of premium revenues on clinical services and quality (or less than 85 percent in the large group market), it is required to provide a rebate to customers. The amount of returned premium dollars returned to Texas under the Experience Rebate provision will be reported. It is expected that total cost of care (capitation payments minus experience rebate) will be less than the total cost of care that would have been incurred under the Medical Loss Ratio regulation.

   Methods. For each demonstration year, Texas proposes to calculate MLR using the formula promulgated by the National Association of Insurance Commissioners and compare any returns against those calculated using the Experience Rebate Provision. The final evaluation report will include a policy analysis comparing and contrasting the two models and any recommendations for improving upon the intended purpose of each cost mechanism.

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[21] http://www.healthcare.gov/law/index.html

Table 1. Intervention One evaluation questions including performance measures, data sources, anticipated outcomes, and deliverable timelines.

Evaluation Measure Type	Evaluation Question	Performance Measure/Indicator	Data Source	Data Periodicity	Deliverable
Process Indicators	Did expansion of STAR to the Hidalgo SDA and STAR+PLUS to the El Paso, Hidalgo, and Lubbock SDA impact access to care for the target population?	Adult access to preventive/ambulatory health services	HEDIS®	Annually	Interim and final evaluation report
		Number of STAR+PLUS members who had inpatient hospital stays per 1,000 members	Managed care and Fee-for-service Encounter data	Monthly	Quarterly and interim and final evaluation report
		Top ten procedures utilized during hospitalizations for STAR+PLUS members who had inpatient hospital stays	CAHPS®	Annually	Interim and final evaluation report
		Average number of miles from STAR+PLUS members to closest participating inpatient hospital in each new service area	STAR+PLUS member addresses obtained from enrollment database. Participating hospitals obtained from Medicaid and Managed care claims data	Annually	Interim and final evaluation report

Evaluation Measure Type	Evaluation Question	Performance Measure/Indicator	Data Source	Data Periodicity	Deliverable
Process Indicators	Has the utilization of preventative (and care coordination) of dental services for children age 20 years and younger changed as a result of the expansion?	Percent of children's Medicaid dental services members who receive at least two dental check-ups in one calendar year	Monthly Medicaid claims files*	Monthly	Quarterly and interim and final evaluation report
		Percent of children's Medicaid dental services members who receive at least one fluoride treatment or dental cleaning in one calendar year			
		Percent of children's Medicaid dental services members who receive at least one diagnostic dental service in one calendar year			
	Has the carve-in of pharmacy benefits into capitated managed care impacted access to care for the target population?	Number of members who use appropriate medications for people with asthma (according to NCQA)	HEDIS®	Annually	Interim and final evaluation report

Evaluation Measure Type	Evaluation Question	Performance Measure/Indicator	Data Source	Data Periodicity	Deliverable
Process Indicators	Did the expansion of STAR and STAR+PLUS to the new service delivery areas impact care coordination for the target population?	Percent of STAR or STAR+PLUS members in each new service area who felt their doctor was informed about the care they received from other providers	CAHPS® survey	Annually	Interim and final evaluation report
	Did automatic re-enrollment after disenrollment for STAR, STAR+PLUS, and children's Medicaid dental services impact continuity of care for the target population?	Frequency of MCO reassignment requests	MAXIMUS, enrollment broker	For one demonstration year	Interim and final evaluation report
		Reason(s) for reassignment request			
Health Outcome Indicators	Have STAR and STAR+PLUS impacted preventable ER visits and hospitalizations over the demonstration period for the target population?	Number of preventable emergency department visits per 1,000 members	HEDIS®	Annually	Interim and final evaluation report
		Number of preventable hospital admissions per 1,000 members			
		Number of preventable hospital readmissions per 1,000 members			

Evaluation Measure Type	Evaluation Question	Performance Measure/Indicator	Data Source	Data Periodicity	Deliverable
Health Outcome Indicators	Have dental MCOs reduced therapeutic dental care to the target population (children) over the demonstration period?	Number of members who received restorative dental services per 1,000 members	HEDIS®	Annually	Interim and final evaluation report
	Has the carve-in of pharmacy benefits into STAR and STAR+PLUS impacted the number of hospital admissions due to an acute asthmatic event?	Number of asthma hospital admissions per 100,000 members	HEDIS®	Annually	Interim and final evaluation report
Cost Outcome Indicators	What is the impact of non-behavioral health inpatient services in the STAR+PLUS program in terms of cost?	Average cost of non-behavioral hospitalizations for STAR+PLUS members	Managed care and FFS Encounter data	Annually	Interim and final evaluation report
	How does Texas' Experience Rebate compare to Medical Loss Ratio regulation as a strategy for ensuring that managed care plans spend an appropriate amount of their premium revenue on medical expenses?	Amount of premium dollars returned to HHSC under the Experience Rebate Provision	TX HHSC Managed Care Operations Finance	Annually	Interim and final evaluation report

* Medicaid monthly claims files are subject to lags in data availability. Claims for most Medicaid services are available within three months of the date of service. Performance measures will be based on the data available at the end of the quarter or year. Performance measures that include Medicaid claims data will be identified as incomplete, and will be revised in the following report.

Intervention 2: Formation of Regional Healthcare Partnership (RHP) Regions (Evaluation Goals 5 – 11)

Given the Program description of RHP formation, the evaluation will include measures of process indicators describing the formation and sustainability of RHP governance structures and operations, outcome indicators, and cost outcome indicators. Process indicators will include measures of governance, stakeholder engagement, learning collaborative participation, and identifying community needs assessment. RHP projects will be developed based on the community needs identified (Provided to HHSC on October 31, 2012). Each project (Due to HHSC on December 31, 2012) will have required deliverables from each RHP, thus allowing for standardized means of comparing projects across RHPs. Health outcome measures will include measures of clinical outcomes that are associated with process indicators. Finally, select cost outcome indicators associated with process and health outcome indicators will be examined for changes associated with process or health outcome measures.

Comparative Case Study

A prospective research design will entail data collected in years 2-5 to compare performance across four to nine RHPs in the comparative case study. A mixed methods approach using quantitative, qualitative, primary, and secondary data will yield meaningful insights into factors affecting success over time. Within-case analyses will include a baseline profile of each initiative based on the Community Needs Assessment and publically available data (e.g., from Area Resource Files) on local demographics and health service provider supply; quantitative trends in utilization, cost, and quality indicators reported to HHSC; formal governance structure; repeated social network analysis; a timeline of key events; and qualitative analysis of stakeholder interviews and available documentation such as meeting minutes indicative of collaborative processes. To the extent feasible, the evaluators will also measure each initiative's implementation fidelity. Finally, between-case RHP analyses will be used to determine what patterns of resources, governance, regional power dynamics, and implementation processes distinguished more and less successful initiatives over time.

Figure 2. Logic Model for the Health System Transformation Intervention

1115 Texas Waiver Evaluation Logic Model
(Health System Transformation)
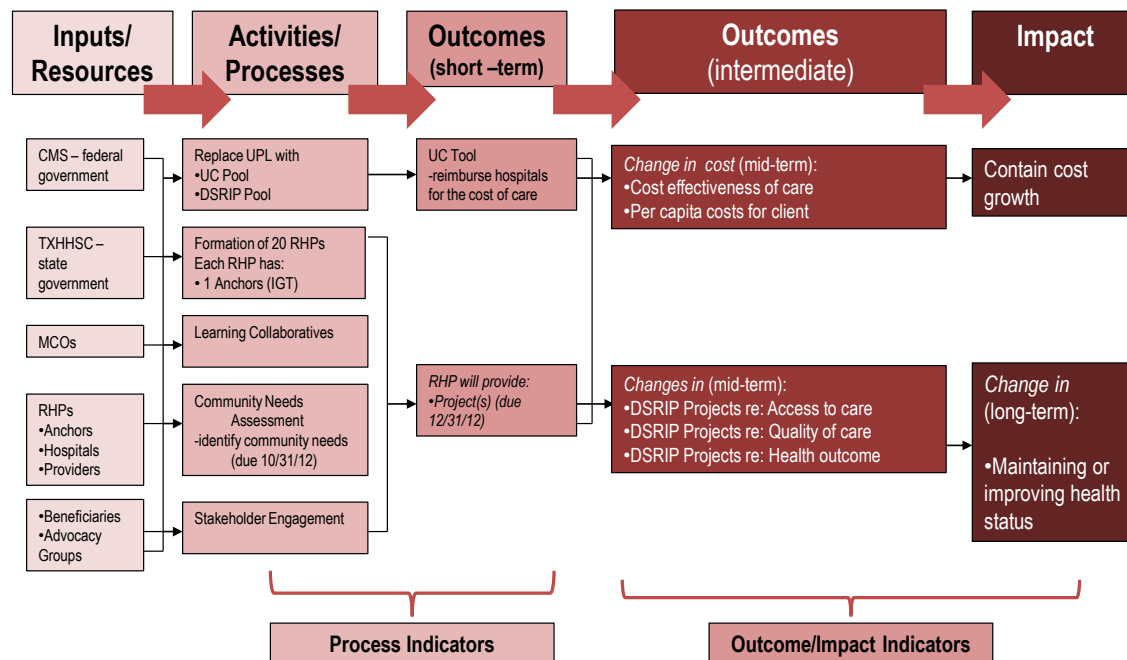
Data Collection

For the second intervention, Texas proposes an evaluation design that focuses on several strategies for data collection.

a. Evaluation of the extent that establishing learning collaborative strategies for success led to continuous quality improvement.

b. A longitudinal comparative case study of four to nine RHPs quantifying and conceptualizing the RHP network (i.e., actors, their interest, and especially their relations as key explanatory factors for examining the effectiveness of selected RHPs). Although network analysis is routinely cross-sectional, the Program intervention provides an opportunity to examine the creation and sustainability of a new governance structure over the demonstration period.

c. Trend comparison between selected RHPs on the extent to which the RHP impacted the quality of care, health of the population served, and/or cost of care.

Evaluation Questions

The evaluation questions are broken down into three evaluation measurement types: Continuous quality improvement measures, process indicators, and outcome indicators. Table 3 presents a summary of each evaluation measurement type including, if available, the performance measure/indicator, the data source, anticipated outcome, and deliverable timeline. Please note that much of the evaluation information for the second intervention will only be known after the submission and acceptance of the project proposals in early 2013.

Continuous Quality Improvement

The evaluation question specifically having to do with continuous quality improvement measures is described below.

1. Does the establishment of learning collaborative strategies by the RHPs lead to continuous quality improvement? (STC 68.a.v)

   o **Learning collaborative.** All RHPs are required to report their quality improvement priorities to HHSC. From these, the external evaluation team will develop a matrix showing which RHPs are addressing which priorities. For every priority addressed by two or more RHPs, external evaluators will convene an annual meeting (via face-to-face or video conference) in 2013 in which each participating RHP will outline their improvement plans, and discuss which common quality, health, and cost measures may be feasible to analyze. The external evaluators will convene quarterly conferences of all RHPs with any given focus.

   On an annual basis, the external evaluators will collect data from each RHPs learning collaborative about their common quality, health, and cost measures, and report these back to all RHPs with any given focus.

Process Indicators

The evaluation question specifically having to do with process indicators is described below.

1. How did anchors, hospitals, and providers collaborate within each RHP to support uncompensated care and delivery system reform? (STC 68.a.iv) (STC 68.a.ii)

   o **Comparative case study.** To understand how differential regional health partnership performance unfolds over time, the external evaluator will conduct a longitudinal comparative case study of four to nine RHPs employing similar project strategies that address a single goal (e.g., improving primary care access to reduce Emergency Department use). The proposed sampling strategy will ensure that RHPs include at least one predominantly rural region, one predominantly urban region, and one mixed urban-rural (see Table 2). Data will be collected between summer 2013 and summer 2016.

Table 2. Hypothetical comparative case study sample.

Level of success: determined over time – hence distribution shown here is speculative	Rurality:	Case:								
		1	2	3	4	5	6	7	8	9
	Mostly successful	R			U			M		
	Partially successful		R			U			M	
	Mostly unsuccessful			R			U			M

R= predominantly rural; U=predominantly urban; M=mixed]

Possible data collected includes:

1. Each RHP's formal governance structure as reported to HHSC.
2. Social network analysis measuring the relationship of RHP stakeholders, their interest, power dynamics, and resource exchanges within each initiative dynamics and resource exchanges within each initiative.
3. Interview data on implementation processes.
4. Focus group and interview data on stakeholder perceptions, and the public health process and outcomes data each RHP reports annually to HHSC.
5. Additional data sources could be added depending on availability and consistency among selected RHPs.

Methods. Texas proposes a purposive sampling strategy for the comparative case study of RHP initiatives for four reasons: (1) we believe that the sample selection bias that is attendant to very low response rates to mail/phone surveys would outweigh the benefits of random sampling of all RHPs and/or stakeholders; (2) interviews or focus groups would yield richer information about how stakeholders experience system changes; emergent themes could be used to inform interview prompts in subsequent interviews or focus groups, as well as report back to RHPs; (3) collecting these data in the case study sites, focused on a common type of initiative across all sites, would remove potentially confounding factors associated with differences across initiative types, and hence improve comparisons and generalizations across sites; and (4) external evaluators will have established relationships with local stakeholders through the other case study data collection, which will improve participation rates and hence the representativeness of the samples.

Outcome Indicators

The evaluation question specifically having to do with outcome indicators is described below.

1. Did RHPs show an improvement in quality of care, access to care, and in health outcomes for individuals served in their catchment areas? (STC 68.a.iii)
   o **Trend comparisons.** To the extent feasible, the external evaluator will also assess progress on goals seven to nine using concurrent comparisons (e.g., difference-in-difference analyses) of trends between RHPs implementing and not implementing a few strategies with substantial health and/or cost implications. Outcome health indicators will be selected from reliable and valid measures that can be collected across multiple sites (e.g., claims and encounter data, HEDIS®, and/or CAHPS® survey questions). A

concurrent comparison approach would be necessary to control for the effect of Affordable Care Act implementation in 2014.

Table 3. Intervention two evaluation questions including performance measures, data sources, anticipated outcomes, and deliverable timelines.

Evaluation Measure Type	Evaluation Question	Performance Measure/Indicator	Data Source	Data Periodicity	Deliverable
Process Indicators	How did anchors, hospitals, and providers coordinate within each RHP to oversee finance payments for uncompensated care costs and incentives for delivery system reform?	Increased communication among RHP stakeholders	RHP stakeholder focus groups, structured interviews	DY2, DY4	Interim and final evaluation report
		Increased coordination and collaboration among health service providers in each RHP	RHP stakeholder focus groups, structured interviews	DY2, DY4	Interim and final evaluation report
		Processes used for governance and decision-making within each RHP	Documentation of the processes and the coordination of those processes in each RHP plan	Annually	Interim and final evaluation report
	What communities' needs were determined from the Community Needs Assessment (due 10/31/12) and what RHP projects result from CNAs?	Summary of needs and related projects by each RHP based on CMS approved guidelines for approved data collection	Community Needs Assessment	Annually	Interim and final evaluation report

Evaluation Measure Type	Evaluation Question	Performance Measure/Indicator	Data Source	Data Periodicity	Deliverable
Health Outcome Indicators	Did RHPs show an improved quality of care for individuals served in their catchment areas?	Quality measures to be determined by metrics included in DSRIP projects submitted by each RHP.	RHP submitted project (due 12/31/12)	Annually	Interim and final evaluation report
	Did RHPs show an improvement in access to care for individuals served in their catchment area?	Access measures to be determined by metrics included in DSRIP projects submitted by each RHP.			
	Did RHPs show improvements in health outcomes for individuals served in their catchment areas?	Health improvement measures to be determined by metrics included in DSRIP projects submitted by each RHP.	Category 3 measures	Annually	
Cost Outcome Indicators	How cost-effective was DSRIP as a program to incentivize change? How did the amount paid in incentives compare with the amount of improvement achieved?	Cost effectiveness analysis to be designed once RHP plans are turned in and compiled.	Funding benchmarks	Annually	Interim and final evaluation report

COMMUNICATION AND REPORTING

This section summarizes how information from the individual evaluation plan process and results will be used and shared. CMS and Texas agreed on several Special Terms and Conditions (STCs) related to the Program, including the following evaluation requirements (see STC 68 through STC 71).

COMMUNICATION WITH CMS PROJECT OFFICER

- Texas will submit drafts of annual and final reports to the CMS Project Officer for comments, and will submit the final evaluation report within 60 days after receipt of CMS comments.

COOPERATION WITH CMS

- Texas will be responsible for the accuracy and completeness of the information contained in all technical documents and reports.

- Should CMS undertake an independent evaluation of any component of the Demonstration, the State shall cooperate fully with CMS or the independent evaluator selected by CMS. The State shall submit the required data to CMS or the contractor.

REPORTING

Reflecting on the purpose of Section 1115 Medicaid waivers to demonstrate innovation, Texas will report and evaluate the 1115 waiver to inform the federal government, Texas, and local governments of the progress achieved and challenges encountered as the demonstration is implemented. Please see Tables 2 and 3 for details on which performance measures will be reported quarterly, annually, by demonstration year, or at the conclusion of the demonstration.

- Texas will submit a narrative progress report to CMS 60 days following the end of each Program quarter. These quarterly reports will provide information regarding the progress of the evaluation plan and planning, evaluation activities, and interim findings. The process of regularly measuring, monitoring, and reporting to stakeholders should result in continuous performance improvement. Quarterly reporting will also provide preliminary data that will be used for the final evaluation scheduled for completion at the end of the waiver on September 30, 2016.

- The state will submit an interim evaluation report by October 1, 2015, or in conjunction with the State's application for renewal of the Demonstration, whichever is earlier. The

purpose of the interim evaluation report is to present preliminary evaluation findings, plans for completing the evaluation design, and submitting a final evaluation report by January 31, 2017. The state shall submit the final interim evaluation report within 60 days after receipt of CMS comments.

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- Texas will submit a draft of the final evaluation report to CMS by January 31, 2017. The State shall submit the final evaluation report within 60 days after receipt of CMS comments.

TIMELINE FOR IMPLEMENTATION OF THE EVALUATION AND REPORTING DELIVERABLES

Data collection for the Program evaluation began on the first day the waiver was approved by CMS. Data will be collected throughout the waiver period. Table 4 includes the evaluation reporting timeline.

Table 4. Texas Healthcare Transformation and Quality Improvement Program Evaluation Reporting Timeline

Report	Includes Data As of the End of…	Delivery to CMS at the End of…
Year 1 Quarters 1 & 2	March 2012	May 2012
Year 1 Quarter 3	June 2012	August 2012
Year 1 Quarter 4	September 2012	November 2012
Year 2 Quarter 1	December 2012	February 2013
Year 2 Quarter 2	March 2013	May 2013
Year 2 Quarter 3	June 2013	August 2013
Year 2 Quarter 4	September 2013	November 2013
Year 3 Quarter 1	December 2013	February 2014
Year 3 Quarter 2	March 2014	May 2014
Year 3 Quarter 3	June 2014	August 2014
Year 3 Quarter 4	September 2014	November 2014
Year 4 Quarter 1	December 2014	February 2015
Year 4 Quarter 2	March 2015	May 2015
Year 4 Quarter 3	June 2015	August 2015
Interim Evaluation Report	**July 2015**	**September 2015**
Year 4 Quarter 4	September 2015	November 2015
Year 5 Quarter 1	December 2015	February 2016
Year 5 Quarter 2	March 2016	May 2016
Year 5 Quarter 3	June 2016	August 2016
Year 5 Quarter 4	September 2016	November 2016
Final Evaluation Report	**September 2016**	**January 2017**

EVALUATION MANAGEMENT

The evaluation will be conducted by internal and external evaluators. Internal evaluators will evaluate intervention one, coordinate report submissions, and provide evaluation project management. Internal and external evaluators will hold regular meetings to facilitate the evaluation of the two interventions, discuss and troubleshoot any issues relating to the implementation of the evaluation, and collaborate on results and reporting.

Internal Evaluators

The Evaluation Unit of HHSC Strategic Decision Support (SDS) will conduct the evaluation of intervention one (the Medicaid Managed Care expansion) and oversee the evaluation of intervention two (Formation of RHPs) of the Program. SDS is an independent branch of HHSC and the internal evaluation unit will leverage the expertise and capacity of evaluating statewide health and human services programs. The Evaluation Unit includes professional program evaluators with expert knowledge of the HHSC data systems used for this evaluation, and with ongoing, unlimited access to the data. The internal evaluation unit has direct access to policy experts and is informed about policy and procedure changes that may affect the evaluation.

In addition to the Evaluation Unit, SDS includes demographers who will be providing population data for the evaluation, and more than 30 analysts who work with HHSC data and policies every day. SDS is located within the HHSC Financial Services Division. Financial Services also includes the budget and accounting staff who will be contributing to the evaluation.

External Evaluators

The external evaluation of intervention two (Formation of RHPs) will be conducted by the Texas A&M School of Rural Public Health, in their Department of Health Policy and Management. HHSC has worked with Texas A&M in the past and has a long standing relationship with their research staff. Texas A&M brings a great depth of experience and knowledge of HHSC programs and services. Specifically, their research staff has substantial experience in conducting complex, large-scale, multi-site evaluations at the state and local level; local, state, and national level quantitative surveys with Medicaid/CHIP members, providers, and other key stakeholders described in the evaluation.

The external evaluation team will be led by Drs. Rebecca Wells and Monica Wendel. Dr. Wells is the incoming Department Head in the Department of Health Policy and Management. Her experience includes: (1) comparative case studies of FQHC-led networks, behavioral health

care for low income families involved with child welfare, and implementation of a Medicaid medical homes model for pregnant women and children; (2) social network analyses of behavioral health-primary care integration and public mental health system responses to people in crisis; (3) longitudinal analysis of a state-wide care coordination initiative's implementation; and (4) multiple regression analyses of how teamwork within and across safety net providers affected health care use and outcomes.

Dr. Wendel is the Assistant Dean for Community Health Systems Innovation at the School of Rural Public Health and is an assistant professor in the Department of Health Policy and Management. She has led several large-scale, multi-site complex evaluations, including the Steps to a Healthier San Antonio program (funded by the Centers for Disease Control), Legacy Partners for Healthier Communities (funded by the American Legacy Foundation), and the Minority Youth Tobacco Elimination Project (funded by the Office of Minority Health). Each of these evaluations included a multi-site, mixed methods design and entailed both process and outcome measures.

APPENDIX H: REFEREED AND NON-REFEREED PRESENTATIONS

Presented in chronological order

Refereed Publication:

Pennel, C., Tamayo, L., Wells, R., Sunbury, T. (2016). Emergency medical service-based care coordination for three rural communities. *Journal of Health Care for the Poor and Underserved.* 27:159–180.

Doctoral Dissertations:

Nida Ali (University of Louisville, PhD April 2017)

Affan Ghaffari (Texas A&M University, PhD May 2017)

Loida Tamayo (Texas A&M University, PhD Fall 2017)

Refereed Presentations:

Roper-Coleman S. & Sunbury, T. Summary of the Texas Healthcare Transformation and Quality Improvement Program: a section 1115(a) waiver demonstration. American Evaluation Association, Washington, DC, Oct 16–19, 2013. (Oral)

Sunbury, T. & Roper-Coleman, S. Evaluation Design and Analytic Methodology of Texas' 1115 Medicaid Demonstration Waiver Evaluation: Expanding Medicaid Managed Care Statewide. American Evaluation Association, Washington, DC, Oct 16–19, 2013. (Oral)

Wendel M.L. Designing an evaluation for the delivery system reform incentive program supported by Texas' 1115 Medicaid demonstration waiver. American Evaluation Association, Washington, DC, Oct 16–19, 2013. (Oral)

Sunbury T., Kum H., Ghaffari A., & Gregory S. Building an efficient hybrid human machine system for ongoing record linkage. Academy Health Annual Research Meeting, San Diego, CA, Jun 8–10, 2014. (Poster)

Cummings, A., Sunbury, T., & Roper-Coleman, S. Using quality measures to monitor and evaluate the impact of pharmacy carve-in implemented through an 1115(a) demonstration waiver: The Texas healthcare transformation and quality improvement program. American Public Health Association, New Orleans, LA, Nov 15–19, 2014. (Poster)

Roper-Coleman S., Wendel, M., Wells, R., Sunbury, T., & Cummings, A. A pragmatic approach to guide the design of a mixed methods evaluation of a Medicaid 1115(a) waiver: The Texas healthcare transformation and quality improvement program. American Public Health Association, New Orleans, LA, Nov 15–19, 2014. (Oral)

Sunbury, T., Roper-Coleman, S. & Cummings, A. Applying health service utilization models to the Texas Healthcare Transformation and Quality Improvement Program: Advancing theory-based evaluation. American Public Health Association, New Orleans, LA, Nov 15–19, 2014. (Round table)

Sunbury, T., Roper-Coleman, S. & Cummings, A. Texas Healthcare Transformation and Quality Improvement Program: Impacts of Medicaid policy change on quality of care for aged and disabled population. American Public Health Association, New Orleans, LA, Nov 15–19, 2014. (Oral)

Ghaffari, A. Wells, R., Armstrong, T., Creel, L., Kum, HC, Brossart, D., Roper-Coleman, S., Sunbury, T. Applying relational coordination to inter-agency teamwork and patient experiences with providers. Oral presentation at Organizational Theory in Health Care Conference, Richmond, VA, May 27–29, 2015 (Ghaffari presenting – doctoral students).

Wendel M, Creel L, McMaughan D, Roper-Coleman S, Cummings, A. Transforming the health care system: implementation strengths and challenges in Texas' Healthcare Transformation and Quality Improvement Program 1115(a) Medicaid Waiver. *Academy Health 2015 Annual Research Meeting,* Minneapolis, MN, Jun 11–16, 2015. (Poster)

Wendel M, Creel L, Wells R, Gregory S, Roper-Coleman S, Cummings, A. Using network analysis to understand regional differences in collaboration resulting from the Texas 1115(a) Medicaid Waiver. *Academy Health 2015 Annual Research Meeting,* Minneapolis, MN, Jun 11–16, 2015. (Poster)

Tamayo L, Kum HC, Wells R, Du Y, Roper-Coleman S, Sunbury T. Health Status and Health Experience Among Adult, Hispanic, Frequent ED Users. *AcademyHealth 2015 Annual Research Meeting,* Minneapolis, MN, Jun 11–16, 2015. (Poster)

Ghaffari, A. Wells, R., Armstrong, T., Creel, L., Kum, HC, Brossart, D., Roper-Coleman, S., Sunbury, T. Applying relational coordination to inter-agency teamwork and patient experiences with providers. Poster Presentation at 2015 *AcademyHealth Annual Research Meeting*, Minneapolis, MN.

Wendel M., Creel, L. Wells, R., Roper-Coleman, S., Sunbury, T. Using network analysis to measure changes in local collaboration resulting from implementation of the Texas Healthcare Transformation and Quality Improvement Program. *APHA Annual Meeting and Exposition*, Chicago, IL, Oct 31–Nov 4, 2015. (Oral, Wendel/Creel presenting)

Wendel M., Creel, L., McMaughan, Roper-Coleman, S., Cummings, A. Stakeholder Perceptions of Strengths and Challenges in Texas' Healthcare Transformation and Quality Improvement Program. *APHA Annual Meeting and Exposition*, Chicago, IL, Oct 31–Nov 4, 2015. (Oral, Wendel/Creel presenting)

Tamayo L, Pennel C. Wells R., Sunbury T. Emergency Medical Service-based Care Navigation in Three Rural Texas Communities. *AcademyHealth 2016 Annual Research Meeting,* Washington, DC, June 26 - 28, 2016. (Poster)

Non-refereed Local Presentations:

Wendel M.L., Wells R., & Gregory S. Intervention II evaluation design. Presentation to the 2013 Evaluation Work Group, Austin, TX, Sept 9, 2013.

Wells R. Evaluation of regional healthcare partnerships within the healthcare transformation and quality improvement program. Presentation to the HHSC Executive Waiver Advisory Committee, Austin, TX, Jul 11, 2013.

Roper-Coleman, S. Evaluating the delivery system reform incentive program supported by Texas' 1115 Medicaid demonstration waiver, Presentation to Regional Health Partnership 15 representatives, El Paso, TX, Jan 22, 2014

Wells R. Evaluating the delivery system reform incentive program supported by Texas' 1115 Medicaid demonstration waiver, Presentation to Regional Health Partnership 15 representatives, El Paso, TX, Jan 22, 2014.

Roper-Coleman S, & Wells R. Evaluating the 1115(a) demonstration waiver – healthcare transformation quality improvement program. Presentation to the Texas Diabetes Council, Apr 24, 2014.

Wendel M, Creel L. Evaluation of the Texas Healthcare Transformation and Quality Improvement Program: 1115(a) Medicaid Demonstration Waiver. *Presentation at the Statewide Learning Collaborative Summit,* Sept 10, 2014.

Potential Refereed Publications:

Evaluators are also planning and drafting additional publications not listed here.