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ARKANSAS CENTER FOR HEALTH IMPROVEMENT

Arkansas Health Care Independence Program ("Private Option") Section 1115 Demonstration Waiver Interim Report

June 16, 2016

About the Evaluators

The Arkansas Center for Health Improvement (ACHI) is a nonpartisan, independent health policy center whose vision is to be a trusted health policy leader committed to innovations that improve the health of Arkansans. This vision is carried out through ACHI's mission to be a catalyst for improving the health of Arkansans through evidence-based research, public issue advocacy, and collaborative program development. In undertaking this mission, ACHI has worked hard to develop and adhere to an important set of values that guide the Center. ACHI's core values are commitment, initiative, trust, and innovation. These are the fundamental principles that guide the Center's collective and individual decisions, strategies, and actions to advance the health of Arkansans. These core values define what ACHI—the organization and its people—stand for throughout time, regardless of changes in ACHI's internal structure and leadership, or in response to external factors and environmental conditions.

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Suggested Citation

Arkansas Center for Health Improvement. *Arkansas Health Care Independence Program ("Private Option") Section 1115 Demonstration Waiver Interim Report*. Little Rock, AR: Arkansas Center for Health Improvement, March 2016.

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iv. Abbreviations

ACHI	Arkansas Center for Health Improvement
AHA	The Arkansas Hospital Association
AHRQ	Agency for Healthcare Research and Quality
AID	Arkansas Insurance Department
AV	actuarial value
BNC	budget neutrality cap
CAHPS	the Consumer Assessment of Healthcare Providers and Systems
CPT	current procedure terminology
CSR	cost-sharing reduction
CY	Calendar Year
DHS	Arkansas Department of Human Services
ER	Emergency Room
FFM	Federally Facilitated Marketplace
FFS	fee-for-service
FPL	federal poverty level
FQHC	federally-qualified community health center
HbA1c	hemoglobin A1c
HCIP	Health Care Independence Program
HEDIS	Healthcare Effectiveness Data and Information Set
LDL-c	lipoprotein
LSM	least squares mean
Marketplace	individual health insurance marketplace
MEPS	Medical Expenditure Panel Survey
MLR	medical loss ratio
NCQA	National Committee for Quality Assurance
NEMT	non-emergency medical transportation
NYU	New York University
PCCM	Primary Care Case Management
PCP	Primary Care Provider

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PMPM	per-member per-month
PPACA	Patient Protection and Affordable Care Act
PY	Person Years
PY1	Program Year 1
PY2	Program Year 2
PY3	Program Year 3
QHP	Qualified Health Plan
Questionnaire	Health Care Needs Assessment Questionnaire
SIPTW	stabilized inverse probability of treatment weighting
SNAP	supplemental nutrition assistance program
SSI	Social Security Income
UAMS	University of Arkansas for Medical Sciences
UPL	upper payment limit

v.   Executive Summary

Background

The State of Arkansas, navigating the political barriers facing many states, pursued a novel approach to Medicaid expansion through the commercial sector. Through a Section 1115 demonstration waiver, the state utilized premium assistance to secure private health insurance offered on the newly formed individual health insurance marketplace (the Marketplace) for individuals between 19 and 64 years of age with incomes at or below 138 percent of the federal poverty level (FPL). [1]

In 2014, Arkansas successfully established the Health Care Independence Program (HCIP)[2], commonly referred to as the "Private Option," as designed under the terms and conditions of the Section 1115 demonstration waiver. Through 2015, the estimated target-enrollment population of approximately 250,000 was met. Approximately 25,000 additional individuals eligible under the Patient Protection and Affordable Care Act (PPACA) and deemed to have exceptional healthcare needs were enrolled in the traditional Medicaid program. Finally, approximately 20,000 previously eligible but newly enrolled individuals have also obtained Medicaid coverage.

Healthcare providers have reported significant clinical and financial effects under the HCIP. Federally qualified community health centers (FQHCs) reported increased success in attaining needed specialty referrals for their clients.[3] The Arkansas Hospital Association (AHA) reported annualized reductions in uninsured outpatient visits, emergency room (ER) visits, and hospital admissions by 45.7 percent, 38.8 percent, and 48.7 percent, respectively[4]. The state's public teaching hospital reported a reduction in uninsured admissions from 16 percent to 3 percent during the same time period.[5]

Competitiveness and consumer choice in the Marketplace has increased across the seven market regions in the state with approximately 80 percent of the covered lives in the individual marketplace purchased by Medicaid. In 2014, individuals in three out of the seven regions of the state, those marked by extreme poverty, only had access to Arkansas BlueCross BlueShield and BlueCross BlueShield Multistate plans offered. By 2016, five carriers were offering coverage across all seven market regions, with one market region having access to six carriers (the sixth restricted to a single market by Medicaid's purchasing guidance limiting premium assistance to those plans within 10 percent of the second-lowest cost silver plan within the market region).

For 2014, the estimated budget neutrality cap (BNC) was exceeded during the initial enrollment phase of the program. The enrollment of younger individuals over time (affecting net premiums), the rebate of medical-loss ratio (MLR) payments by one carrier not meeting the MLR requirements in 2014, and inflationary expectations brought cumulative program costs within the estimated BNC 2015 limit of $500.08 per-member per-month (PMPM) and well under the 2016 limit of $526.58 PMPM. Importantly, this evaluation examines BNC estimates compared to observed expenditures.

Summary of Interim Findings Based on Evaluation Hypotheses

The HCIP programmatic goals and objectives included successful enrollment, enhanced access to quality health care, improved the quality of care and outcomes, and enhanced continuity of coverage and care at times of re-enrollment and during income fluctuations. These goals and objectives were to be achieved within a cost-effective framework for the Medicaid program compared with what would have occurred if the state had provided coverage to the same expansion group in Arkansas traditional Medicaid's traditional fee-for-service (FFS) delivery system. This report reflects the experience and findings from the first year of beneficiary experience in 2014 and major findings are summarized below by questions of interest.

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1. ***What were differences across access, quality, and outcomes between those enrolled in Medicaid and those enrolled in commercial Qualified Health Plans (QHPs)?***

   A major assumption grounded in Arkansas's use of premium assistance through the Marketplace was that by utilizing the delivery system available to the privately enrolled individuals in the Marketplace, the availability and accessibility of both primary care providers (PCPs) and specialists would exceed that of a more traditional Arkansas Medicaid expansion. A comparison of Medicaid and commercial QHP beneficiary results revealed:

   • The geographic proximity of available primary and specialty providers were similar for those served by Medicaid and the commercial networks and met network adequacy requirements of the Arkansas Insurance Department;

   • However, marked differences in the self-reported accessibility of both primary care and specialty providers were reported with commercial QHP enrollees experiencing increased ability to get needed "care, tests, and treatment" and receiving "an appointment for a check-up or routine care as soon as needed";

   • Initiation of care occurred more rapidly for enrollees in QHPs than for those in the Medicaid program following enrollment;

   • For Emergency Room (ER) use, Medicaid enrollees not only had a higher number of visits but their visits were approximately 60 percent more likely to be for non-emergent conditions potentially reflecting the access barriers reported above; and

   • Although limited in the first year of program experience, differences in care and clinical service delivery were observed with commercial QHP enrollees more likely to receive clinical preventive services (e.g., flu prophylaxis or clinical screenings, and HbA1c assessment for diabetics) than Medicaid enrollees.

2. ***What were the differences in costs between Medicaid and premium assistance?***

   The cost of providing coverage for Medicaid beneficiaries through commercial premium assistance in QHPs was expected to be greater than that for Medicaid beneficiaries served through the traditional Medicaid FFS system. Exploration and characterization of the contrasts between the two programs provided a better understanding of the observed variations in access, utilization, and clinical impacts described above. In addition, dramatic differences in payment rates were observed with commercial rates consistently exceeding those in the Medicaid program:

   • Physician payment rates across outpatient services were 90 percent higher for enrollees in a commercial QHP compared to their Medicaid counterparts (for PCPs a weighted average per visit of $100.67 compared to $53.07);

   • For inpatient hospital stays, average commercial payments were $11,984 per discharge compared to Medicaid payments of $7,778 (a 53 percent difference);

   • For ER non-hospitalized visits, commercial payments were $598 per visit compared to Medicaid payments of $196 (a 205 percent difference); and

   • Administrative costs were estimated to be $60.61 PMPM--an 18 percent medical loss ratio--for commercial QHPs and a $55.37 PMPM for Medicaid (a 9.5 percent difference).

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Utilization differences were also observed but not at the same magnitude as payment differentials. Medicaid beneficiaries, under the FFS system, experienced increased ER visits and hospitalizations. Conversely, Medicaid beneficiaries enrolled in QHPs received more outpatient visit contacts and prescriptions.

3. ***What were the cost-effective aspects of premium assistance?***

Cost-effectiveness for the purposes of this evaluation will evaluate any benefits associated with care delivered through QHPs at increased payment rates. While premature to draw conclusions from the first year of program experience, preliminary assessments through two approaches provide a framework for comparison. First, total program costs for newly enrolled individuals in commercial QHPs were directly compared to their Medicaid counterparts. Second, where plausible, ratios of improvement in care to associated costs were developed (e.g., access improvements compared to payment rate differentials).

- The weighted average payment to commercial QHPs (premium and cost-sharing reductions) was $485 PMPM or $5,820 per year compared to Medicaid costs of $272 PMPM or $3,264 per year for each enrollee (using existing Medicaid payment rates).

- Improved access reflected by self-report of "always getting care when needed right away" suggest a 1.48 percent improvement in access per 10 percent increase in provider payment rates for the general population and a 1.88 percent improvement in access per 10 percent increase in provider payment rates for those with increased need. These findings are consistent with published observations of 1.25 percent improvements in access per 10 percent increase in Medicaid payment rates suggesting Arkansas provider accessibility is dependent upon payment rates.

Over the three year demonstration period, differences in effect will be compared to the additional costs incurred by Medicaid through premium assistance. These comparisons will enable more in depth interpretation of the program's benefit.

4. ***What would the Medicaid program have experienced if a traditional Medicaid expansion had been adopted?***

Examination of the hypothetical costs of covering the entire expansion population in Arkansas's traditional Medicaid program and the programmatic changes necessary to achieve a similar outcome to that experienced through premium assistance is a core component of this demonstration evaluation. Arkansas had one of the lowest Medicaid eligibility thresholds for non-disabled adults in the US. In 2013, prior to the PPACA expansion, Arkansas Medicaid covered 24,955 non-disabled adults with a full benefit package. In 2014, following PPACA expansion, an additional 267,000 individuals were covered representing a ten-fold increase in enrollment. 84 percent were managed externally in the individual commercial marketplace.

Traditional microeconomics suggests that increased demand through the expansion of the Medicaid program would place increasing price pressure on the rate structure of the existing Medicaid program. Observed differences in payment rates between commercial QHPs and Medicaid described above could lead to unsustainable access differentials for Medicaid enrollees. Any potential increase in payment rates could affect not only the new expansion population but also enrollees under the same payment rate schedule across the entire Medicaid program. To model the potential effects, a budgetary impact analysis was conducted on increasing payment rates across the Medicaid program.

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Three increasingly conservative scenarios were simulated for alternative expansion purposes through the existing Medicaid FFS system, the counterfactual, to provide policy makers with conditions under which necessary increases to achieve equitable access could be considered. They included: 1) claims potentially associated with wage-sensitive services; 2) restricted claims associated with major medical services; and 3) restricted to claims associated only with physician billed services.

The budget impact analysis revealed:

- Costs to the Medicaid program would exceed the increased costs associated with premium assistance:

  o if wage-sensitive payment rates had increased by 15 percent;

  o if claims associated with clinical services had increased by 25 percent; or

  o if physician-only claims had increased by 35 percent;

- Importantly, under the most conservative scenario of increases restricted to physician-only claims, the physician rate increase at which the Medicaid program costs exceed those of premium assistance remains 61 percent below the commercial payment rates observed. This suggests the likelihood of continued differential access despite increased payments.

These findings suggest that with a ten-fold increase in enrollment of 19-64 year olds, plausible required increases in Medicaid payment rates across the entire program would exceed the costs associated with purchasing commercial coverage through premium assistance.

These results should be viewed with caution for several reasons. First, cost-sharing reduction reconciliation with carriers in 2014 has not been executed and may result in modifications to payments made. In addition, 2014 represented the first year of the program with significant transitions as reflected in enrollment growth. Future assessments during steady-state periods may provide more accurate reflections of both programmatic effects and associated costs.

Conclusion

The examination of the first year experience of the Section 1115 Demonstration Waiver utilizing commercial premium assistance to provide newly Medicaid eligible individuals with insurance coverage has important policy implications:

- First, differential effects on access and quality were observed, this combined with differential provider payment rates, provide insight into the variations in delivery system performance between the commercial sector and Medicaid.

- Second, it is unlikely that Arkansas Medicaid would have been able to absorb a ten-fold increase in enrollees and meet the federal equal access requirements, under which the state is subject to judiciary review, without adjustment to provider rates. Although political discourse has highlighted concerns about the differences in absolute cost between commercial and Medicaid alternatives, Medicaid expansion scenarios under which similar clinical experiences would be achieved suggest budgetary outcomes that may mitigate these concerns.

- Third, these differential payment rates and associated results raise questions regarding the ability of Medicaid programs nationwide to meet the federal equal access requirements through delivery system strategies that pay providers significantly lower rates.

As result, the innovative use of premium assistance and the intimate relationship between the individual commercial insurance marketplace and the Arkansas Medicaid program warrant continued observation. The effect of Medicaid's capacity to purchase coverage through commercial premium assistance and its impact on increased commercial sector competition, the potential to reduce cost-shifting between public and private sectors, the stabilized insurance premiums offered through the Marketplace and, due to federal requirements, off of the Marketplace, and the impact on private sector costs and those to the U.S. Treasury through advanced premium tax credits should be closely followed. If one or more of these effects materialize, important considerations will be required for both existing (e.g., Section 1115) and future (e.g., Section 1332) waiver options between the states and the federal government.

I. Background

The U.S. Supreme Court's June 2012 ruling[6] allowed states to decide whether to extend Medicaid benefits to their citizens who qualify under the Patient Protection and Affordable Care Act (PPACA) expansion. This amplified the political polarization about the PPACA at the state level, resulting in varied decisions about expansion. Historically, states have had the option to implement Medicaid coverage through direct provider reimbursement, Medicaid managed care contracts, or the purchase of coverage with premium assistance through employer-sponsored coverage.

The State of Arkansas, navigating the political barriers facing many states, pursued a novel approach to expansion through the commercial sector. Through a Section 1115 demonstration waiver, the state utilized premium assistance to secure private individual health insurance offered on the newly formed individual health insurance marketplace (the Marketplace) to individuals between 19 and 64 years of age with incomes at or below 138 percent of the federal poverty level (FPL).[1] The Health Care Independence Program (HCIP),[2] commonly referred to as the "Private Option," provided coverage to over 225,000 low-income Arkansans through 2015.

One component of the waiver's terms and conditions is a required evaluation of differences in access, quality, outcomes, and efficiencies achieved through the use of commercial coverage for the low-income expansion population.[7] The evaluation examines differences in both effects and costs through commercial premium assistance compared to the experience that would have been achieved through a traditional Medicaid expansion as a principal outcome of interest for the demonstration.

a. Arkansas Profile

Arkansas is a largely rural state with approximately 3 million citizens, many of whom face significant healthcare challenges. These include high health-risk burdens; low median-family income; high rates of uninsured individuals; and limited provider capacity, particularly in non-urban areas of the state. The Health Resources and Services Administration has designated 74 of Arkansas's 75 counties as medically underserved.[8] Prior to the PPACA, 25 percent of adult Arkansans between 18 and 64 years of age were without health insurance.[9]

Arkansas's Medicaid program prior to the HCIP had one of the most stringent eligibility thresholds in the nation for adults, largely limiting coverage to the aged, disabled, and parents with extremely low incomes and limited assets. Eligibility for adults between 19 and 64 years of age was restricted to parents/caretakers earning at, or below 17 percent FPL. Prior to expansion, non-disabled adults with full benefits constituted 18 percent of the Medicaid enrollees.[10] Expansion of the program under the PPACA more than doubled the number of 19 to 64 year old eligible beneficiaries.[10]

The Arkansas Medicaid program is a Primary Care Case Management (PCCM) fee-for-service (FFS) based delivery system. Individuals are assigned to a primary care provider and providers may limit the number of Medicaid beneficiaries assigned.[11] Medicaid provider reimbursement rates are significantly below their commercial counterparts. Supplemental payments for select hospitals—critical access hospitals, public and private hospitals, and state teaching hospitals—have been used to support delivery-system stability. Providers elect to join as a qualified Medicaid provider but may limit the number of Medicaid beneficiaries they serve.

The commercial insurance marketplace has historically consisted of two carriers with statewide coverage, including a dominant carrier with over 65 percent of private coverage penetration and other regional carriers. The predominant network structure is preferred provider organizations with limited managed care and/or the presence of restricted networks. This is in part due to Arkansas's "any willing provider"[12] law, requiring insurers to allow any provider willing to accept terms for the class of providers into their networks.[12] Under the PPACA, the

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state elected to utilize the Federally Facilitated Marketplace (FFM) partnership in which the state conducts plan management and consumer outreach.[13] Proactive consumer outreach and advertising was limited to responsive consumer support based upon state legislative restrictions.

b.   Arkansas Structure of Commercial Premium Assistance

The Arkansas approach utilizing commercial premium assistance has several unique attributes that successfully meet both Medicaid requirements and protections while enabling commercial sector independence. Arkansas's approach was in large part based upon the hypotheses that Arkansas could not meet the equal access provision requiring state Medicaid provider payments to be "consistent with efficiency, economy, and quality of care and ...sufficient to enlist enough providers so that care and services are available under the plan at least to the extent that such care and services are available to the general population in the geographic area."[14] Successful use of the commercial plans offered on the Marketplace explicitly meet the equal access provision of Medicaid requirements. However, several structural elements warrant acknowledgement and are described.

First, Medicaid's purchase of individual commercial coverage via premium assistance is fundamentally different from the historic use of Medicaid managed care. In premium assistance, the Medicaid program does not directly contract with the private carrier but rather purchases plans offered on the individual marketplace. While a memorandum of understanding was established between the state, Medicaid, the Arkansas Insurance Department (AID), and each carrier to facilitate payments, AID governs plans through existing state law and certification requirements (e.g., network adequacy). The Medicaid population is then integrated into the privately insured risk pool, and provider payment rates are established by commercial carriers, not through independent Medicaid contracts. Medicaid beneficiaries engage providers with commercial insurance cards and are not segregated into a Medicaid-specific program or plan.

Second, plans offered under the PPACA were utilized to meet a majority of the Medicaid cost-sharing protections. For individuals at or below 100 percent FPL, the state utilized the 100 percent actuarial value (AV) plan required to be available for Native Americans. For Medicaid beneficiaries between 101 and 138 percent FPL, the state utilized the high-value silver 94 percent AV plan required to be offered on the Marketplace to individuals between 101 and 150 percent FPL. The remaining Medicaid-required cost-sharing protections were achieved through active structuring of allowable deductibles and other cost sharing.[15] Importantly, these plans consist both of premiums subject to medical-loss ratio (MLR) requirements of 80 percent and of cost-sharing reductions (CSRs) that are to be fully reconciled (see Figure 1).

The AID divided the state into seven geographic market regions, and carriers established age-specific premiums within market regions (one carrier incorporated allowable tobacco use surcharges). The costs of premium assistance through the individual marketplace was thus influenced by the premium variation based on age within each market region, the age-distribution of those deemed eligible, CSRs paid, and any subsequent repayments for failure to meet MLR requirements or reconciliation of CSR.[a]

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[a] CSR reconciliation for CY 2014 is expected to occur in summer 2016.

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Figure 1. HCIP Premium and Cost-Sharing Reduction Breakdown

	3.5%	**Additional cost-sharing reduction for HCIP enrollees from 0% to 100% FPL**
	2.5%	**Deductible buy-down for HCIP enrollees from 101% to 138% FPL**
100% **2014: Per-Member Per-Month (PMPM) cap of $469.05 ($477.63* with wrap-around costs)**	**24.0%**	**Cost-sharing reduction for enrollees from 139% to 150% FPL**
	70.0%	**Premium**

Audit Processes:
● Subject to reconciliation
● Subject to medical-loss ratio
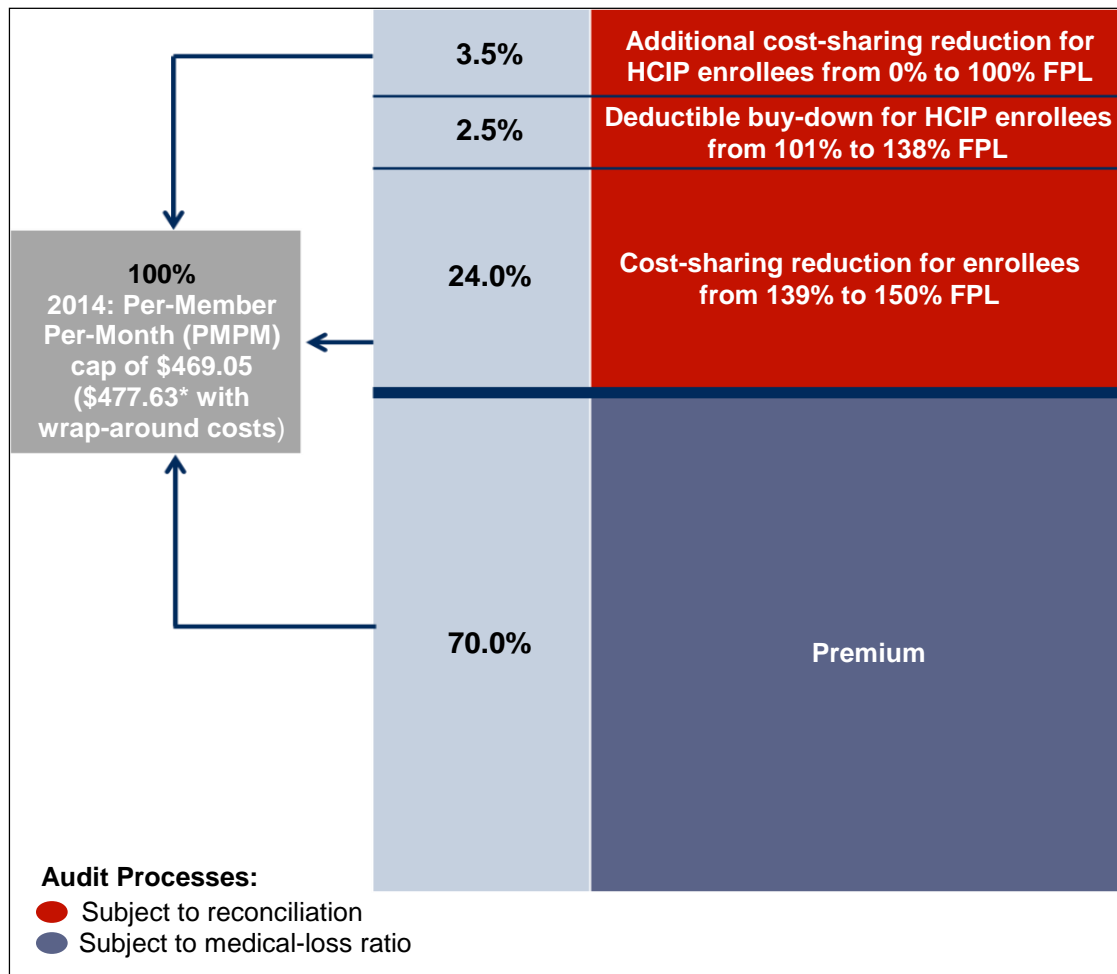
* Actual PMPM cost in December 2014 was $485.84 (186,950 enrollees). The 2015 PMPM cap was $500.08 with an actual PMPM cost of $486.86 at the end of December 2015 (200,703 enrollees).
Source: "Arkansas Health Care Independence Program Annual Cap." *Arkansas Department of Human Services.*

Finally, the impact of Medicaid's guaranteed purchase in the individual insurance market had the potential to convey stability to the individual marketplace and improve the actuarial profile of the risk pool. The HCIP Act further extended potential benefits to the actuarial profile of the individual marketplace by requiring that individuals who were medically frail or had exceptional healthcare needs whom would require supplemental Medicaid benefits be retained in the traditional Medicaid program.

c. Arkansas Structure of PPACA Eligibility and Enrollment

As an FFM partnership with the state conducting plan management and consumer assistance combined with Medicaid's use of premium assistance, the Arkansas structure for PPACA eligibility and enrollment was complex. Arkansas employed three pathways for eligibility determination for beneficiaries—Arkansas Department of Human Services (DHS) supplemental nutrition assistance program (SNAP)-facilitated enrollment; an Arkansas eligibility web portal (access.arkansas.gov); and the federal Healthcare.gov portal. Following eligibility determination, individuals were directed to a separate enrollment portal (insureark.org) to facilitate a healthcare needs assessment and plan selection.

The SNAP-facilitated eligibility determination strategy was a time-limited effort to reach out and engage potentially eligible beneficiaries. Through prior income determination for SNAP benefits, DHS identified

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individuals and notified them of their eligibility. Redetermination of income or family composition was not conducted. Individuals who affirmed their desire for coverage in response to the notice were directed to the enrollment website. The Arkansas eligibility portal was utilized by DHS county offices, outreach workers, community and faith-based organizations, and insurance agents across the state. Individuals thought to be Medicaid-eligible were directed to the portal where eligibility applications and FPL determinations were processed. The enrollment pathways and plan assignment process is depicted in Figure 2.

Figure 2. Enrollment Pathways and Plan Assignment Process
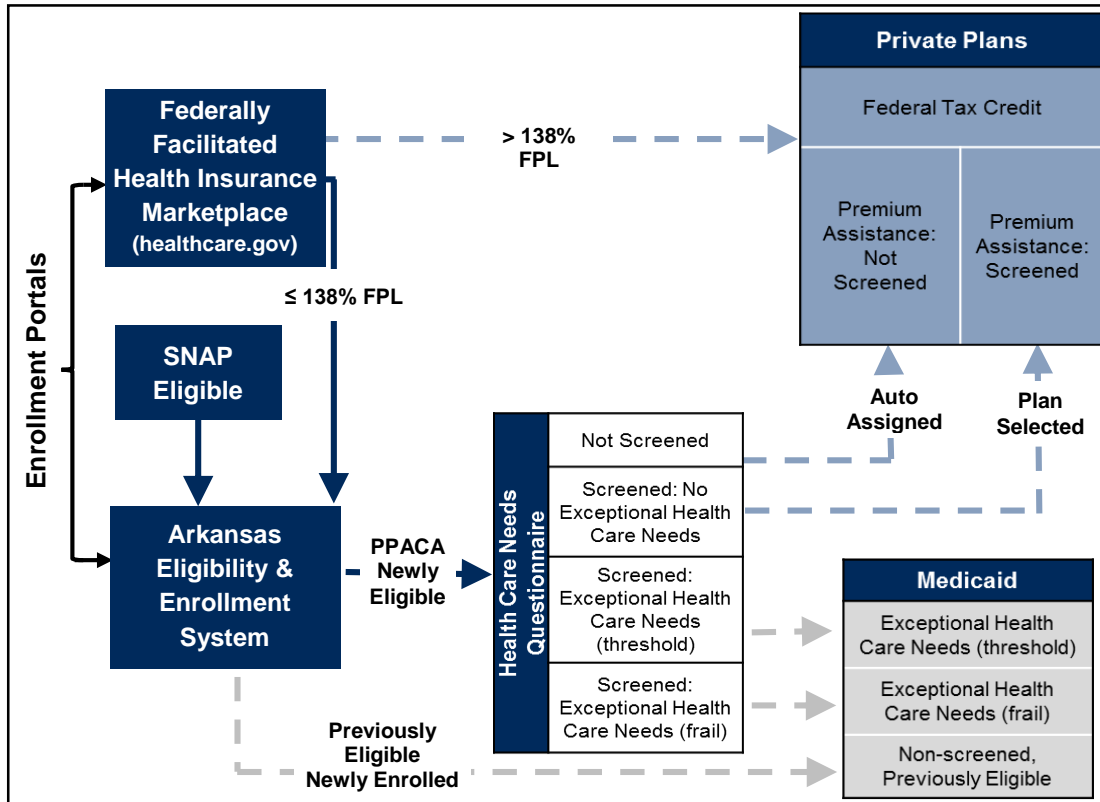
Like many states, individuals and the state both experienced challenges in the first year of the federal Healthcare.gov portal.[16] Individuals identified through the federal portal deemed to be Medicaid eligible were transferred to the state for determination. Frequently, unsuccessful transfer of information resulted in incomplete enrollments, with similar experience noted by commercial carriers for individuals above 138 percent FPL. Over time, the volume of enrollees and accuracy of eligibility information improved.

Two categories of eligible individuals were observed. One category was comprised of individuals who had previously been eligible for traditional Medicaid benefits but had not enrolled who then subsequently applied and were determined to be eligible. These individuals were placed into the Medicaid program. The second category included individuals newly eligible under the PPACA—parent/caretakers from 18 percent FPL and childless adults from 0 percent FPL, up to 138 percent FPL. These individuals were eligible for commercial premium assistance under the demonstration waiver. Prior to commercial enrollment, however, individuals were asked to complete a Health Care Needs Assessment Questionnaire (the Questionnaire) to retain those with exceptional healthcare needs in the traditional Medicaid program.

Required in the HCIP Act, these retained individuals were to include those "…determined to be more effectively covered through the standard Medicaid program, such as an individual who is medically frail [b] or other individuals with exceptional medical needs for whom coverage through the Health Insurance Marketplace is determined to be impractical, overly complex, or would undermine continuity or effectiveness of care." No previously developed and validated tool for this purpose was known to exist.

The Arkansas Center for Health Improvement (ACHI) and the Arkansas DHS Division of Medical Services collaborated with experts at the University of Michigan and the Agency for Health Care Research and Quality (AHRQ) to develop a screener to identify newly eligible Medicaid applicants who had exceptional healthcare needs. A pooled subsample from the Household Component of the Medical Expenditure Panel Survey (MEPS), 2005-2010,[17] was used to develop the Questionnaire items and scoring thresholds. Questionnaire responses categorized individuals into one of three categories:

1) Exceptional health care needs (Frail): those who reported exceptional healthcare needs as represented by deficits in their "activities of daily living," having severe mental illness, and/or being dependent or homeless;

2) Exceptional health care needs (Threshold): those who reported high healthcare use in the prior six months through hospitalization, emergency room, and/or outpatient visits who met the predetermined threshold; and

3) No exceptional health care needs: those completing the Questionnaire who did not meet any criteria outlined in (1) or exceed the predetermined threshold.

Individuals completing the screener and deemed as not having exceptional healthcare needs proceeded to select plans offered on the individual marketplace through the state's enrollment portal. The predetermined threshold target was selected to achieve 10 percent retention for PPACA-newly eligible within the Medicaid program as operationalized from the HCIP contract.

Importantly, approximately 50 percent of those determined to be PPACA eligible did not proceed to the enrollment portal and complete the Questionnaire. After a maximum of 45 days, these individuals entered an auto-assignment process. Individuals were auto-assigned to carriers based upon previously determined ratios tied to the number of carriers in each of the seven insurance market regions. Auto-assigned individuals had a time-limited opportunity to take the Questionnaire and choose to change carriers. Individuals could either chose to stay with assigned plans or choose another plan during subsequent open-enrollment periods each year or for qualifying family events.

Following selection or auto-assignment, DHS executed monthly premium payments to the carriers on behalf of the individuals. Individuals in the commercial plans received a letter with their Medicaid Identification Number and, subsequently, a commercial insurance card from their carrier. Medicaid-retained individuals received a Medicaid Insurance Card.

d. Arkansas Program Experience to Date

Enrollment in the HCIP and for other newly eligible individuals both within Medicaid and those above 138 percent FPL in the individual marketplace has resulted in a reduction in the uninsured rate for adults from 22.5 percent to 9.6 percent, the largest reduction observed nationwide.[18] More than 250,000 Arkansans have enrolled, with approximately 45,000 through the SNAP facilitated eligibility. Approximately half have taken the Questionnaire,

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[b] Note that Medically Frail as defined in the HCIP Act and operationalized in the HCIP preceded the current definition of the Medically Frail as found in 42 CFR 440.315(f).

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with 10 percent of the total new enrollment deemed as having exceptional healthcare needs and maintained in traditional Medicaid. An additional 22,000 adults previously eligible (but not enrolled) for traditional Medicaid have become newly enrolled in those programs. Through premium assistance, Medicaid has purchased individual plans for approximately 225,000 individuals (see Figure 3).[19]

Figure 3. HCIP Monthly Enrollment, January 2014 through January 2016
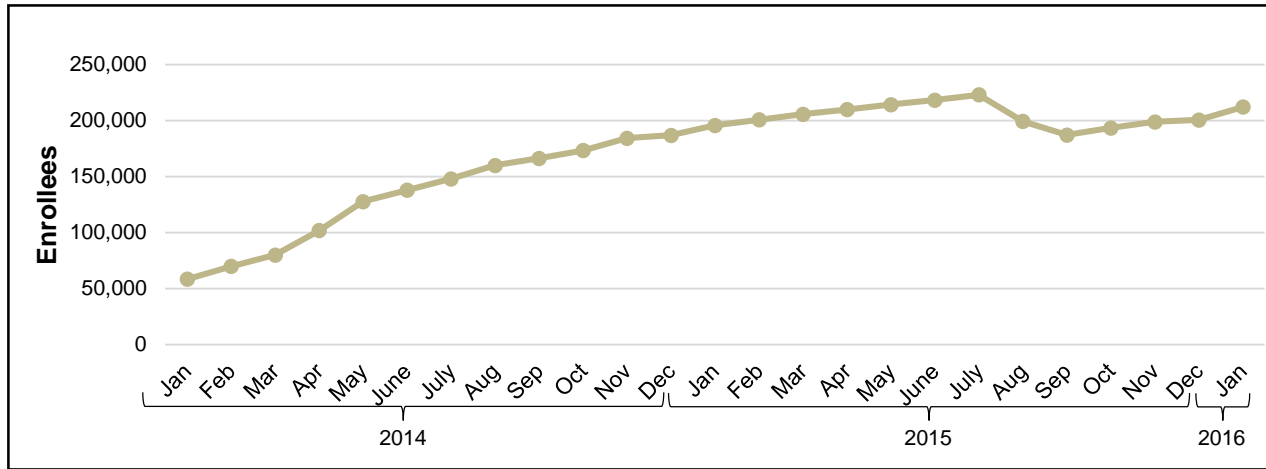
HCIP enrollees represent approximately 80 percent of the covered lives on the individual marketplace. They are younger than their counterparts above 138 percent of the poverty line participating in the Marketplace (see Figure 4).[20, 21]

Carrier participation, and thus beneficiary choice, has increased the number of participating carriers in each market region. Of the seven market regions in 2014, only three had more than two carrier options. For 2016, statewide all regions have five carriers, with one region having six participating carriers. Premiums for the benchmark silver plan in the largest market region dropped 2.3 percent in 2015[22] and experienced an increase of 3.7

Figure 4. Enrollment Age Demographics by Category

percent in 2016.[22] Because insurance premiums external to the Marketplace are tied to those on the Marketplace, similar rate effects were seen in the non-marketplace PPACA-compliant market.

Healthcare providers report both significant clinical and financial effects. Federally qualified community health centers (FQHCs) report increased success in attaining needed specialty referrals for their clients.[3] The Arkansas Hospital Association (AHA) compared service use and uninsured volumes between 2013 and 2014. They found an increase of ER visits by 5 percent and a reduction in uninsured outpatient visits, ER visits and admissions by 45.7 percent, 38.8 percent, and 48.7 percent, respectively.[4] The University of Arkansas for Medical Sciences (UAMS) has reported a reduction in uninsured admissions from 16 percent to 3 percent during a same time period.[5]

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The Section 1115 demonstration waiver required an estimated budget neutrality cap (BNC) represented as a per-member per-month (PMPM) cost for program expenditures.[7] These expenditures include premiums, CSRs, and required Medicaid benefits (wrap-around costs associated with required benefits, e.g., non-emergency transportation) not covered through premium assistance. Program expenditures to date are within the estimated budget neutrality caps established within the conditions of the Section 1115 demonstration waiver with cumulative program expenditures at the beginning of Program Year 3 (PY3) (January 2016) equal to $489.01 PMPM, 7.1 percent below the PY3—Calendar Year (CY) 2016—federal cap of $526.58. During Program Year 1 (PY1)—CY 2014—cumulative program expenditures exceeded the BNC as demonstrated in Figure 5, but were under the estimated cap by Program Year 2 (PY2)—CY 2015.[19] This observation included effects due to the enrollment of younger individuals over time affecting net premiums, the rebate of MLR premiums by one carrier who did not meet the MLR requirements, and inflationary expectations built into the BNC estimates. Importantly, this evaluation will replace BNC estimates with realized experience.

Figure 5. HCIP Premium and Cost-Sharing Reduction Breakdown, January 2014 through January 2016
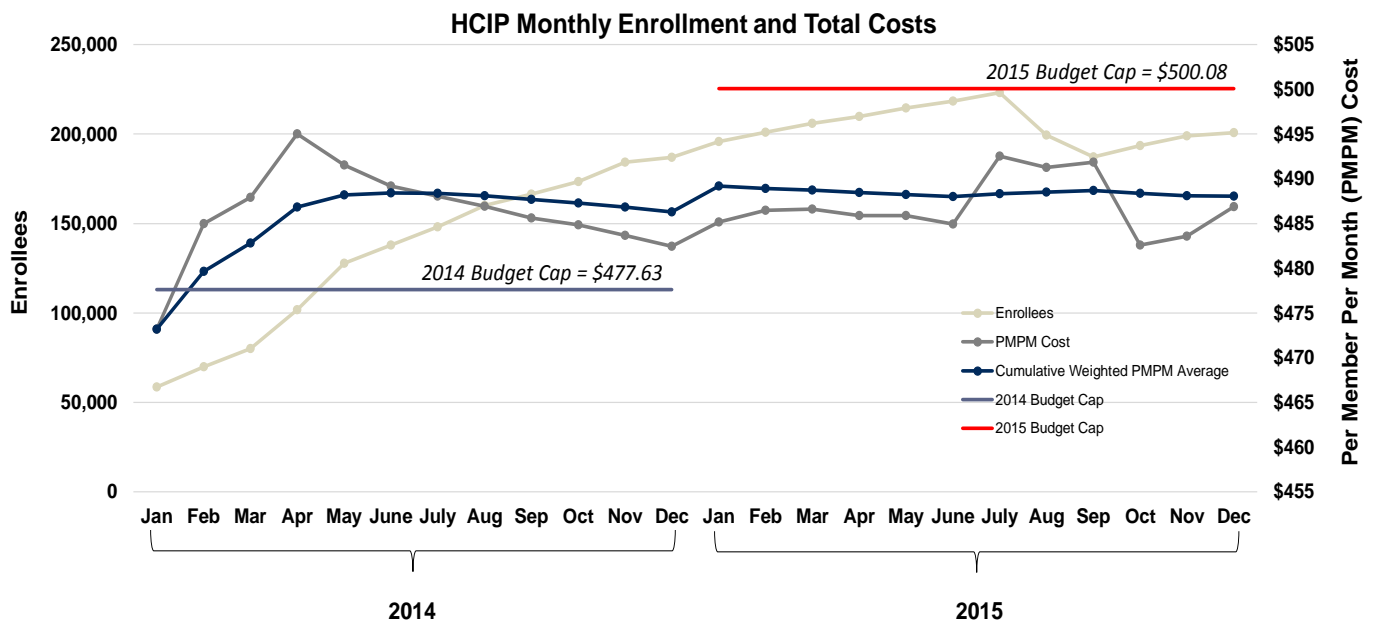
HCIP management has moved from a start-up phase to a steady-state management phase. The first six months of 2014 experienced significant enrollment growth, followed by 12 months of relative steady-state program performance. In the fall of 2014, income and eligibility redeterminations for Medicaid were delayed due to information technology limitations on the eligibility and enrollment system. In July of 2015, these determinations were restarted resulting in termination of coverage for approximately 10 percent of the covered lives.[23] Finally, in 2016, DHS implemented purchasing strategies through which premium assistance would only be available for plans that were priced within 10 percent of the second lowest plan within the market region.[24]

e. Arkansas HCIP Evaluation Strategy

The Section 1115 demonstration waiver terms and conditions state the requirements for submission of an Interim Report 90 days following completion of the second programmatic year with a final report due within 180 days and a final summative report due within 360 days following completion of the three-year demonstration. This report

serves as the former and represents the first programmatic year of the HCIP—2014. As expected, this report reflecting the start-up period in the first year has certain limitations—quality metrics requiring enrollment periods of 12 months or greater are problematic, continuity of care and coverage are not yet observable, and steady state comparisons of system performance are premature. However, variations in experienced access, utilization by types and location of services, and healthcare engagement opportunities to address unmet needs are each a focus of examination. Cost comparisons for the primary comparison of premium assistance to what would have been experienced under a traditional Medicaid expansion are simulated. However, it is important to note that the CSR reconciliation for 2014 has not been completed and thus is not included in these analyses.

Following this report, we anticipate release of interim findings prior to the final report that will finalize the 2014 cost estimates, assess quality of care between the two programs during a steady state period (July 2014 – June 2015), evaluate continuity of care and coverage following the redetermination period (July 2015 – December 2015), and re-examine changes in the effectiveness and costs associated with the use of premium assistance for Medicaid beneficiaries. A summary of these and additional findings will comprise the final report due in 2017.

II. Research Design and Approach

a. Goals and Objectives

The HCIP programmatic goals and objectives included successful enrollment, enhanced access to quality health care, improved quality of care and outcomes, and enhanced continuity of coverage and care at times of re-enrollment and income fluctuation. These goals and objectives were to be achieved within a cost-effective framework for the Medicaid program compared with what would have occurred if the state had provided coverage for the same expansion group in Arkansas Medicaid's traditional delivery system.

Figure 6. Arkansas Demonstration Waiver Evaluation Logic Model
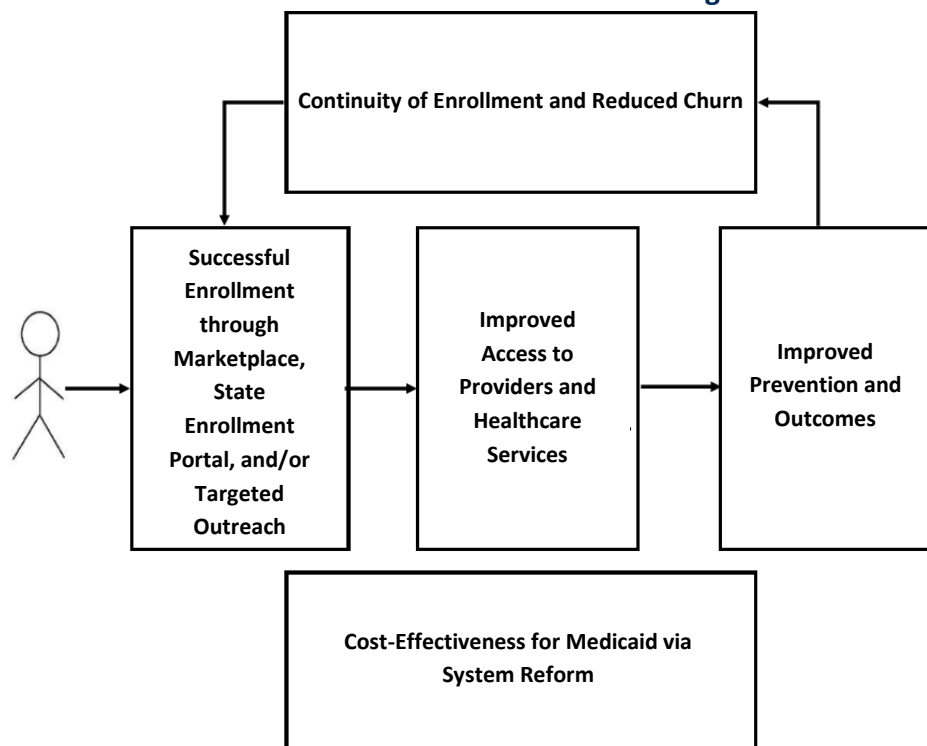
Following the evaluation logic model (see Figure 6), this interim report will present results from analyses that used geographic travel time between enrollees and providers, enrollment information, retrospective claims data, and

sampled survey responses. Using two different comparison groups and approaches, the evaluation team empirically assessed whether QHP enrollees obtained better access to providers and healthcare services by using commercial carrier networks and payment rates than comparable groups enrolled in traditional Medicaid. We also assessed whether QHP enrollees received more appropriate care, including prevention, chronic disease management, and therapeutic interventions potentially leading to better outcomes than their Medicaid counterparts. In 2014, the HCIP program did not include programmatic redetermination or re-enrollment as was previously anticipated, thus limiting the potential to assess continuity of care during the time period of this report. A profile of the effects of disruptions in continuous insurance coverage ("churn") will be included in the final report. Differences in program costs between premium assistance and traditional Medicaid were determined and evaluated with respect to differences in access, utilization, quality, and outcomes. In addition, the alternative of expansion solely within the traditional Medicaid program was assessed by examining program impact and simulating alternative payment scenarios with the goal of achieving similar outcomes.

b.   Programmatic Timeline and Reporting Requirements

Under the terms of the Section 1115 demonstration waiver, two reports are required to be submitted that characterize the experiences of beneficiaries enrolled in Qualified Health Plans (QHPs) using premium assistance. A key component in the required reports is a comparison of QHP beneficiary experiences to similar cohorts of new beneficiaries who were enrolled in traditional Medicaid. Another key component is to present a counterfactual analysis of what it would have cost Medicaid to enroll HCIP enrollees to achieve the same access, quality, and outcomes.

Efforts to optimize comparisons of care between that provided through commercial premium assistance and that provided through the Medicaid program have been incorporated into this demonstration evaluation. Program experience to date has included a significant uptake period during the initial six months of the program followed by 12 months of steady state program enrollment due to delays in eligibility redeterminations by DHS. Redeterminations in the summer of 2015 resulted in a number of previously enrolled individuals being terminated (10 percent) from Medicaid and premium assistance programs, resulting in a stimulus for discontinuity of coverage and care. Finally, the state is in the process of making decisions to continue premium assistance beyond 2016 that will avert disenrollment during the final year of the three-year demonstration. As depicted in Figure 7, we have modified the original timing of evaluation components in response to these programmatic experiences.

Figure 7. Arkansas Health Care Independence Program Period: System Evaluation

This interim report includes assessments of care using claims data for the first program year in 2014, survey data from the first half of 2015, and enrollment information from both 2014 and 2015. Future assessments of quality

and utilization data will reflect the steady state periods depicted, and continuity assessments will assess the impact of redeterminations in 2015. In addition, cost-effectiveness and counterfactual simulations will be reported by period, with updates due to lags in select financial reports (e.g., cost-sharing reconciliation) as they become available.

c.   Theoretical Approach

The approach and content of this evaluation focuses on a comparison of experiences of access and quality as well as the outcomes experienced between Arkansans enrolled in traditional Medicaid and those enrolled in a QHP through premium assistance. We also evaluate the cost-effectiveness of offering private health insurance by covering costs through premium assistance rather than expanding the Medicaid program and assess the counterfactual experience that would have been expected through expansion in the traditional Medicaid program. Questions we address in this interim report include:

1. *What were differences across access, quality, and outcomes between those enrolled in Medicaid and those enrolled in QHPs?*

   A major assumption grounded in Arkansas's use of premium assistance through the Marketplace was that by utilizing the delivery system available to the privately enrolled individuals in the Marketplace the availability and accessibility of both primary care providers and specialists would have exceeded that of a more traditional Arkansas Medicaid expansion. By purchasing health insurance offered on the Marketplace and utilizing private sector provider networks and their established payment rates, traditional barriers to equitable health care, including limited specialist participation and provider availability, would be minimized. In fact, through the use of commercial plans offered on the Marketplace, providers were not be able to differentiate privately insured individuals supported by Medicaid premium assistance (e.g., those earning less than 138 percent FPL), those supported by tax credits (139 percent – 400 percent FPL), or those earning above 400 percent FPL purchasing from the carriers offering plans in the Marketplace.

   The PPACA required through federal regulation that QHPs "…maintain a network that is sufficient in number and types of providers, including providers that specialize in mental health and substance abuse services, to assure that all services will be accessible without unreasonable delay."[25] The AID has developed network adequacy targets and data submission requirements to ensure adequacy of provider networks in QHPs offered in the Marketplace. The AID established network adequacy requirements to be reported by participating carriers on an annual basis. This reporting requires data to be submitted demonstrating a 30-mile or 30-minute coverage radius from each general/family practitioner or internal medicine provider, and each family practitioner/pediatrician. In addition, data/maps must be submitted demonstrating a 60-mile or 60-minute coverage radius from each category of specialist including, but not limited to: Cardiologists, Endocrinologists, Obstetricians, Oncologists, Ophthalmologists, Psychiatric and State Licensed Clinical Psychologists, and Pulmonologists. In this interim report, we use similar definitions for geographic accessibility of providers and perceived access indicators from the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey to compare access of traditional Medicaid enrollees to those in QHPs.

   To assess quality and outcomes, measures were selected based on National Quality Forum (NQF), guidelines, and peer reviewed studies that rate and compare health plans and providers. This included reviews of national healthcare quality guidance, including AHRQ National Healthcare Quality Reports (Agency for Healthcare Research and Quality, 2012 and 2013 National Healthcare Quality Reports), the U.S. Department of Health and Human Services Annual Progress Report to Congress ("National Strategy for Quality Improvement: 2013 Annual Progress Report to Congress, July 2013) the Centers for Medicare and Medicaid Services ("Medicaid Core Set: Core Set of Health Care Quality Measures for Adults Enrolled in Medicaid:

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Technical Specifications and Resource Manual for Federal Fiscal Year 2014 Reporting," May 2014, *CMS*), CAHPS Reporting Guidance (CAHPS Reporting: Reporting Measures for CAHPS® Health Plan Survey 4.0.), and NCQA HEDIS (National Committee for Quality Assurance. Healthcare Effectiveness Data and Information Set [HEDIS].[26]

For this interim report, additional considerations for this assessment of care and outcomes were to select measures that could be evaluated over a relatively short time frame of 12 months, could be assessed efficiently by patient self-report or by administrative claims data (measures requiring electronic medical/hospital records or provider reporting sources were excluded), and those that have been previously used to assess care for Medicaid and commercially insured patients. Final measures selected for empirical testing were a-priori selected based on oversight from the National Advisory Committee for this evaluation. The final listing of measures empirically tested to determine differences in access, quality, and outcomes between Medicaid and QHP enrollees are contained in Appendix 1.

2. *What were the differences in costs between Medicaid and premium assistance?*

Costs to the program were taken from the perspective of the Medicaid program as the payer. For commercial costs, these included the PMPM premium payments made to commercial carriers on behalf of enrolled individuals. These PMPM premiums were specific to market region, age, and for one carrier, tobacco status. In addition to premiums, CSR payments to commercial carriers to achieve Medicaid out-of-pocket cost-sharing limits were included. Medicaid expenditures for non-covered benefits in the commercial plans (e.g., non-emergency medical transportation (NEMT)) were also included. Finally, any MLR rebates due were deducted, and when fully reconciled, CSR payments will be adjusted (estimated June 2016).

For Medicaid costs, the calculated PMPM expenditure was more complex. Medicaid claims were isolated for those enrollees in the Medicaid comparison groups. Because Arkansas Medicaid incorporates several supplemental payment strategies to select providers, allocation of these additional payments was necessary to achieve a true claim related expenditure. Hospitals in four categories—teaching, public, private, and critical access—were eligible for supplemental payments up to the Medicare upper payment limit (UPL) for both inpatient and outpatient services. In addition, critical access hospitals and UAMS were eligible for cost-based reimbursement for select services. Total non-claims based payments to providers by Medicaid was obtained for 2014 and allocated proportionately to providers by service utilization to achieve a loaded claims PMPM. Administrative costs were identified from DHS expenditure reports. Non-changing costs (e.g., Disproportionate Share, Graduate Medical Education, facility costs) were not included in PMPM estimates, as these would not have changed under alternative expansion approaches. For enrollee-specific costs (e.g., enrollment, case-management, etc.) a per-enrollee estimate was generated from the existing Medicaid program and applied to the loaded claims.

3. *What were the cost-effective aspects of premium assistance?*

Under the premise of the waiver authority, the cost of purchasing healthcare insurance through QHPs using premium assistance was expected to be greater than purchasing care through the traditional Medicaid system due to the compressed Medicaid rates publicly available (e.g., $850 per diem for hospitalizations). Concurrently, the commercial care management strategies and differences in provider payments were hypothesized to contribute to better access, more appropriate healthcare utilization, and better quality and outcomes.

Effectiveness was assessed through access, utilization, quality, and outcome metrics described above. Costs were assessed through two approaches. First, by direct comparison of experienced costs for newly enrolled individuals between those in QHPs and those in the Medicaid program will provide absolute differences in

program costs. Modeling efforts to estimate the experience of QHP enrollees and project a PMPM had they been in traditional Medicaid will be employed. In addition, PMPMs from newly eligible and enrolled 19-64 year old Medicaid beneficiaries will be calculated.

Second, where plausible, ratios of improvement in care to associated costs will be developed (e.g., access improvements compared to rate differentials). While no single cost-effectiveness ratio is attainable, observed effect differences can be interpreted with respect to differential costs between the two programs. If differential effects on access, utilization, quality, and outcomes are observed, program effects will be expected to lead to measureable health improvements over time. As data on medium- to long-term health effects are not available in the first year of an evaluation, we have provided cost and outcome data from the first year of the evaluation. This will allow policy makers to evaluate the potential trade-off of increased cost relative to important indicators focusing on access, quality of care, and adverse event reduction consistent with health improvement.

4. *What would the Medicaid program have experienced if a traditional Medicaid expansion had been adopted?*

Examination of the hypothetical costs of covering the entire expansion population in Arkansas's traditional Medicaid program and the programmatic changes necessary to achieve a similar outcome to that experienced through premium assistance is a core component of the demonstration evaluation. Consideration must be given to the existing Medicaid program, its level of network participation, and the impact of existing payment rates given differences identified through this evaluation. In addition, the price elasticity of the supply of medical providers and their ability and/or willingness to provide for the healthcare needs of the expansion population through the existing Medicaid program must be considered. Finally, if payment rate changes were required to achieve access and quality outcomes what would be the financial impact of those modifications across the entire Medicaid program (e.g., rate changes would apply to all Medicaid rates, not only those associated with PPACA newly eligible adults). We provide a basis for this rationale and simulate results under various pricing scenarios within this report.

d. Hypotheses

To address the theoretical questions above, we tested hypotheses that aligned with the original 12 hypotheses outlined in Section 1115 demonstration Waiver Terms and Conditions, STC 70, #1 (see Appendix 2). Broadly, the original hypotheses fell into four categories:

1. HCIP beneficiaries will have *equal or better access* to healthcare compared with what they would have otherwise had in the Medicaid system over time. Access will be evaluated using measures for geographic, perceived, and realized access, use of ER services, potentially preventable ER and hospital admissions, and non-emergency transportation services.
2. HCIP beneficiaries will have *equal or better care and outcomes* compared with what they would have otherwise had in the Medicaid system over time. Quality and outcomes will be evaluated using measures of preventive (primary, secondary, and tertiary) and healthcare services, preventable medical events, and health services utilization.
3. HCIP beneficiaries will have better continuity of care compared with what they would have otherwise had in the Medicaid system over time. While a profile of 2014 continuity of coverage will be presented, limited information in the first programmatic year is available to test this hypothesis. Following the redetermination of eligibility that occurred in 2015, a more substantive continuity of care analysis testing for gaps in insurance coverage, maintenance of continuous access to the same health plans, and maintenance of continuous access to the same providers will be presented in the final report.

4. <u>Services provided to HCIP beneficiaries will prove to be *cost-effective*.</u> Cost-effectiveness will be evaluated using findings from testing the above hypotheses in combination with the following cost determinations from the first programmatic year in 2014:

    a. *For HCIP beneficiaries, fewer gaps in enrollment, improved continuity of care, and resultant lower Medicaid administrative costs would be experienced through premium assistance.* Anticipated metrics include cross-year carrier and Medicaid enrollment, cross-year continuity of primary care provider engagement, and impact of administrative cost allocation to carriers compared to alternative Medicaid administration. Since we do not have cross-year experience, we have limited results to report at this time.

    b. *Through HCIP use of premium assistance in the individual commercial marketplace, performance characteristics of the Marketplace will be enhanced through increased carrier competition, stabilization of the actuarial risk pool, and limited premium increases over time.*

    For this interim report, we have limited results to study trends on premium effects over time. We include enrollment information, carrier participation, market competition, and premium increases available at the time of this report (2014 and 2015). Comparison of the actuarial impact on the HCIP participation in the commercial marketplace is anticipated during the second programmatic year (2015) to minimize the influence of year one (2014) programmatic initiation effects.

    c. *Use of premium assistance in the individual commercial marketplace will prove to be cost-effective for the program compared to what it would have cost to cover the same population in Arkansas Medicaid system.*

    Simulation of the counterfactual experience, had all PPACA expansion occurred through the Medicaid program, including the impact on non-PPACA Medicaid programmatic costs, will reflect one of the primary outcomes of interest for this hypothesis.

e.   Data Sources and Analytic Comparison Groups

Data were obtained from three primary data sources: Arkansas Medicaid enrollment files from the DHS Division of County Operations, administrative claims data (Medicaid and QHPs) and a member enrollment survey (CAHPS). In order to construct variables of interest, additional data were obtained from the Department of Workforce Services, Arkansas Department of Health (vital records death certificate), the Arkansas Health Data Initiative, and the Medicaid-administered exceptional health care needs Questionnaire. In addition, enrollee and network provider addresses were geocoded and distances between enrollees and providers were calculated. Details on data processing can be found in Appendix 3.

External claims data were assessed for consistency and integrity before being processed by the analytic data team. Our team established a step-by-step logic flow to execute data exclusions and to create the final analytical dataset. See Appendix 4 for a listing of exclusions and a flowchart of the process to establish a final analytical dataset in which we created four non-overlapping subpopulations where Medicaid and QHP enrollees were compared within two groups.

To assess differences between the programmatic effects of commercial premium assistance to Medicaid, we utilized two available comparison strategies—1) a matched comparison group based upon demographics of Medicaid and QHP enrollees who did not take the Questionnaire (the "General Population"); and 2) comparison between those who took the exceptional health care needs Questionnaire and self-reported higher healthcare needs in the six months prior to enrollment (the "Higher Needs") and were subsequently assigned to either Medicaid or QHP enrollment.

Table 1 summarizes our comparison-group enrollee numbers and is followed by a description of the comparison groups.

Table 1. Comparison Group Description and Analytical Data Populations

DATA SOURCE	General Population Comparison Group 1		Higher Needs Comparison Group 2	
	Traditional **Medicaid** (did not complete the Questionnaire)	**QHP** (did not complete the Questionnaire)	**Medicaid** (completed the s Questionnaire and met the threshold)	**QHP** (completed the Questionnaire but did not meet the threshold)
CLAIMS	N = 11,006	N = 69,499	N = 10,893	N = 60,031
CAHPS	N = 648	N = 895	N = 1,569	N = 1,914
Note: Enrollees in Comparison Group 2 were oversampled for CAHPS attributing to the higher number of responses.				

Medicaid Enrollees with Higher Needs/Premium Assistance Enrollees with Higher Needs

Approximately 108,000 HCIP enrollees completed a healthcare needs assessment screener. Select individuals who reported deficits in activities of daily living, severe mental illness, or were homeless were automatically assigned to Medicaid and are not included in this evaluation. For the remainder, composite scores were compiled where all screened had a score on a continuum that ranged between 0.02 (no utilization) and 0.61 (extremely high utilization). A "threshold" was established at 0.18 based on the assumption that 10 percent of those who took the Questionnaire would demonstrate a higher need. Individuals with composite scores lower than 0.18 had the option of choosing a QHP or they were auto-assigned to a QHP, while those with a composite score value of 0.18 or higher were deemed to have exceptional healthcare needs and were assigned to a Medicaid plan. Because those near the threshold reported near similar experiences in terms of higher utilization, programmatic assignment enables application of quasi-experimental methods to test for differential program effects.

New Traditional Medicaid Enrollees/New Premium Assistance Commercial Enrollees Balanced on Key Demographics

The original design to test low-income parents on the traditional Medicaid program (at or below 17 percent FPL) to low-income parents in the QHPs (more than 17 percent FPL) and replicate quasi-experimental methods similar to those described above was not achievable. Fidelity of the income variable and parental status in the DHS enrollment data violated the assumptions required for this methodological approach. Because of income discrepancies identified related to eligibility-determination combined with the fact that income is determined at the point of eligibility determination and varies substantively, the original approach was deemed infeasible.

However, because individuals previously eligible for Medicaid but newly enrolled were not screened for exceptional healthcare needs and over 116,000 of the newly eligible HCIP enrollees did not take the screener, comparison of newly enrolled non-screened individuals within the two programs was possible. These individuals represent the General Population in each program. They were balanced across programs on demographic variables and provided the ability to compare programmatic effects for the General (i.e., non-screened) Population.

f.   Methodological approaches

Regression Discontinuity

In evaluations such as this where random assignment to treatment and control groups is not feasible, comparisons can be performed by examining subgroups of individuals based on scores just below or above a cut-point value of a predetermined variable. For the higher needs group, this approach offered the opportunity to examine individuals who took the Questionnaire but were assigned to Medicaid or QHP enrollment based upon

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their responses and a predetermined composite score threshold. The assumption is that individuals with very similar scores on either side of the cut-point (threshold) should not differ significantly on need, even though the cut-point assigns the individuals into different groups. Regression discontinuity is a quasi-experimental design that is increasingly being used in evaluation analyses to test differences attributable to group assignment[27].

In our evaluation, roughly one-half of the new enrollees to Medicaid and premium assistance plans completed a health care needs assessment screener (described above). Those with a composite score of less than 0.18 were assigned to a QHP, while those with a score of 0.18 or higher were assigned to a Medicaid plan. If the regression line examining the association between composite score and an outcome variable of interest (e.g., number of ER visits to treat an emergent condition) passes continuously through the cut-point, we would not expect to see a program effect. If we were to observe a sharp jump at the composite score cut-point where the program assignment was made, we would have a strong indication that the jump was due to the program effect and not attributable to individual demographics or traits. Further details on this methodological approach can be found in Addendum Appendix A.

Inverse Propensity Score Weighting

Enrollees were not randomly assigned to the traditional Medicaid plan or a QHP. Therefore, propensity scores can be described as the probability of being assigned to a treatment group (here, our QHP group) given a set of underlying characteristics (or observed covariates).[28] In our evaluation, for those newly eligible individuals in either traditional Medicaid or the QHP who were not screened, we calculated the probability of being assigned to a QHP treatment group (as opposed to the traditional Medicaid control group). We calculated the probability of assignment to treatment based on age, gender, race/ethnicity, and parental status for our geocoded and claims data and we also included obesity status, education, marital, and recent work status covariates for CAHPS data. The goal was to balance the groups assigned to traditional Medicaid or a QHP by the underlying characteristics included in the propensity score models. Using propensity scores in our empirical assessment of group differences in access, quality, or healthcare outcomes has the potential to reduce biases associated with imbalanced underlying characteristics across groups. We used a technique called stabilized inverse probability of treatment weighting (SIPTW) to incorporate propensity scores into our statistical models.[29,30] Further details on this methodological approach can be found in Addendum Appendix A.

Direct Comparison of Programmatic Costs and Cost-Effectiveness Assessment

As described above, while PMPM costs for premium assistance are reflected in the cumulative premiums paid to carriers when combined with Medicaid payments for wrap-around services, including NEMT, no similar source of PMPM costs for Medicaid existed. PMPM costs from both programs were constructed to enable program cost comparisons. Allocation of non-claims related Medicaid payments (supplemental payments) were allocated and Medicaid administrative costs associated with new enrollees (i.e., non-fixed costs) were identified and incorporated as described in Appendix 5.

We calculated PMPMs for observed Medicaid costs, QHP costs, and estimated QHP-experience modeled with Medicaid payment rates, with and without utilization adjustments. We provide direct program cost comparisons based upon actual cumulative premiums paid; modeled PMPMs calculated from distribution of observed utilization experience within the QHPs (inpatient, outpatient, ER, prescriptions filled, and other), modeled projected PMPMs based upon observed QHP utilization experience and estimated administrative costs within the QHPs adjusted for Medicaid payment rates; modeled projected PMPMs based upon modeled QHP enrollee utilization in Medicaid with Medicaid payment rates; and finally, actual Medicaid PMPM rates for newly eligible Medicaid enrollees.

To support policymakers' decisions surrounding cost-effectiveness determination, trade-offs for incremental increases in access associated with identifiable payment increases were determined. Specific provider payment differentials (e.g., primary care outpatient rates) were determined and observed differences in associated effects (e.g., primary care accessibility, inappropriate ER use) facilitated the development of incremental cost-effectiveness ratios for select indicators.

Counterfactual Medicaid Impact Simulation and Sensitivity Analyses

Examination of the hypothetical costs of covering the entire expansion population in Arkansas's traditional Medicaid program and the programmatic changes necessary to achieve a similar outcome to that experienced through premium assistance is a core component of the demonstration evaluation. The price elasticity of the supply of medical providers and their ability and/or willingness to provide for healthcare needs of the expansion population through the existing Medicaid program was the central component of the simulation model.

To model the potential Medicaid program impact of the counterfactual, we examined the potential programmatic impact on costs had increases in payment rates been required to maintain provider access. Individuals whose care would unlikely be exposed to the impact of rate adjustments were excluded (e.g., individuals 65 and over for whom Medicare would be primary payer on most medical services, children less than 1 year old covered on a different payment rate schedule).

Differences observed for total Medicaid expenditures were calculated at incremental increases and expressed as a total program cost effect. These were allocated onto enrollment month Medicaid PMPMs calculated above for the demonstration population. Summation of the experienced Medicaid PMPMs in our comparison groups with the additional PMPM load caused by potential rate increases resulted in the generation of counterfactual PMPMs based upon underlying alternative rate increase scenarios. Importantly for this simulation model, increases in utilization due to increasing rates were not included. Future examination based upon observed utilization differences may be included in the final report.

III. Findings

a. Overview

We open this section presenting results from our statistical data models that tested hypotheses for empirical differences in access, quality, and outcomes between our Medicaid and QHP enrollee groups. As described previously, we used two comparison populations.

The first population compares traditional Medicaid enrollees—those who did not complete the exceptional health care needs Questionnaire—with QHP enrollees who also did not complete the Questionnaire. As previously stated, these enrollees are reflective of the General Population.

The second population includes individuals who completed the Questionnaire. Those who were deemed to have exceptional healthcare needs by virtue of attaining a composite score threshold were assigned to Medicaid. All others completing the Questionnaire who did not attain the threshold were enrolled in a QHP. Using the regression discontinuity approach, conclusions about differences between Medicaid and QHP enrollees in this population are made at the threshold cut-point. Enrollees with composite scores close together on both sides of the cut-point, but covered by different programs, are the focus of this comparison. Therefore, the comparison is thus reflective of a population with higher needs.

Thus, we have two populations containing two comparison groups. Each of the four groups are mutually exclusive and, in total represent, our complete analytical data population. For simplicity in explaining results for the

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populations, we refer to the first population as General Population (depicted in blue in table rows) and the second group as Higher Needs (depicted in red in table rows). In the tables below, adjusted significant estimated-rate and proportion differences are highlighted in bold and italics. A statistically significant difference in Medicaid and QHP proportions or rates is confirmed by a p-value of 0.05 or lower. To facilitate interpretation of contents in the tables, a graphical guide to tables is presented below (see Figure 8).

A brief profile of continuously enrolled HCIP enrollees is presented to demonstrate the stability of enrollment. This is followed by the results of an exercise to present the PMPM costs observed for the Medicaid and QHP enrollees. By using price differences across both programs paid to providers and for services, we estimated PMPM HCIP costs adjusted for Medicaid pricing and utilization enrollee experiences. With these estimates, we performed a sensitivity analysis simulating increases in Medicaid prices likely to have been required to obtain QHP experienced healthcare improvements.

For contextual background and support of our findings, we have placed tables in Appendix 6 that profile 2014 Medicaid and QHP enrollment by month. Appendix 6 also contains tables to visually assess pent-up demand and present demographic profiles of the analytical comparison population groups under study.

b.   How to Interpret Result Tables

Figure 8. Guide to Tables

c.   Access, Quality, and Outcomes Hypotheses Testing

For each hypothesis under study, we present empirical results for the compiled indicators to determine differences between Medicaid and QHP enrollees.

Hypothesis

1. HCIP beneficiaries will have *equal or better* **access** to health care compared with what they would have otherwise had in the Medicaid fee-for-service system over time.

Results contained in Table 2 assessing network adequacy through geographic proximity of providers revealed minimal differences between providers participating in the commercial networks and those accepting Medicaid beneficiaries. The proportion of enrollees within 30 minutes of a primary care physician and the proportion of

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enrollees within 60 minutes of most specialists showed no differences. Minor, but statistically significant differences were observed for Orthopedists and for Oncologists. A higher proportion of QHP enrollees have access to Orthopedists compared to Medicaid enrollees, with differences of 4.9 percent in the General Population and 11.3 percent in the Higher Needs population. Conversely, a higher proportion of Medicaid enrollees have access to Oncologists compared to QHP enrollees, with differences of 4.1 percent in the General Population and 10.2 percent in the Higher Needs population. Except for these minor differences, both the commercial and Medicaid networks met geographic access standards of the AID.

Table 2. Differences in Geographic Access to Health Care between Medicaid and QHP Enrollees

Geographic Access Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value[4])
Proportion of enrollees within 30 minutes of a **Primary Care Physician**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	9,604 (0.993) 0.994 (0.001)	61,918 (0.986) 0.986 (0.003)	- 0.8%	0.494
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	4,487 (0.996) 0.998 (0.001)	25,023 (0.976) 0.971 (0.007)	- 2.7%	0.578
Proportion of enrollees within 60 minutes of a **Cardiologist**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	9,604 (0.994) 0.995 (0.001)	61,918 (0.977) 0.977 (0.001)	- 1.8%	0.116
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	4,489 (0.996) 0.997 (0.002)	24,214 (0.944) 0.953 (0.009)	- 4.4%	0.100
Proportion of enrollees within 60 minutes of an **Obstetrician/Gynecologist**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	6,541 (0.993) 0.994 (0.001)	34,852 (0.990) 0.990 (0.001)	- 0.4%	0.743
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	4,491 (0.997) 0.998 (0.001)	24,947 (0.973) 0.976 (0.003)	- 2.2%	0.466
Proportion of enrollees within 60 minutes of a **Psychiatrist**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	9,604 (0.994) 0.995 (0.001)	61,918 (0.995) 0.995 (0.000)	0.0%	0.968
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	4,491 (0.997) 0.999 (0.001)	25,365 (0.989) 0.984 (0.006)	- 1.5%	0.771
Proportion of enrollees within 60 minutes of an **Orthopedist**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	9,604 (0.937) *0.937 (0.003)*	61,918 (0.983) *0.983 (0.001)*	*4.9%*	*<0.001*
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	3,886 (0.863) *0.867 (0.007)*	24,778 (0.966) *0.965 (0.002)*	*11.3%*	*0.001*
Proportion of enrollees within 60 minutes of an **Ophthalmologist**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	9,604 (0.993) 0.995 (0.001)	61,918 (0.979) 0.978 (0.001)	- 1.7%	0.140
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	4,487 (0.996) 0.997 (0.001)	24,449 (0.953) 0.954 (0.004)	- 4.3%	0.147
Proportion of enrollees within 60 minutes of an **Oncologist**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	9,604 (0.990) *0.991 (0.001)*	61,918 (0.950) *0.950 (0.009)*	*- 4.1%*	*<0.001*
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	4,453 (0.989) *0.989 (0.002)*	22,999 (0.897) *0.888 (0.006)*	*- 10.2%*	*0.001*
Proportion of enrollees within 60 minutes of a **General Surgeon**. (source: GIS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	9,604 (0.994) 0.995 (0.001)	61,918 (0.995) 0.995 (0.000)	0.0%	0.984
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	4,491 (0.997) 0.998 (0.001)	25,415 (0.991) 0.993 (0.001)	- 0.5%	0.872

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using a logistic regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. Due to problems fitting full models we restricted this analysis to only enrollees in rural regions. [3] Relative percent calculated as (QHP – Medicaid)/Medicaid x 100.
[4] Due to lack of geographic access being a rare event, p-values for differences were obtained using a Poisson regression.
Abbreviations: n=number of persons; LSM=least squares estimated mean; StdErr=standard error of estimated mean.

In Table 3 we present results from four perceived access measures that shows QHP enrollees having better perceived access than Medicaid enrollees across three measures in the General Population, and two measures in the Higher Needs population. For enrollees who reported needing care right away, a greater proportion of QHP enrollees in both populations reported always receiving care as soon as needed compared to their Medicaid enrollee comparison populations (13.2 percent higher in the General Population and 16.9 percent higher in the Higher Needs population). In addition, QHP enrollees were also more successful in always having ease of receiving

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the care, tests, and treatment they needed compared to Medicaid enrollees (40.5 percent higher in the General Population and 19.6 percent higher in the Higher Needs population). We also conclude that a greater proportion of General Population QHP enrollees always got an appointment for a check-up or routine care as soon as needed compared to traditional Medicaid enrollees (12.1 percent higher) but cannot conclude a difference for the same indicator across the Medicaid and QHP enrollees for those in the Higher Needs population.

Table 3. Differences in Perceived Access to Health Care between Medicaid and QHP Enrollees

Perceived and Realized Access Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value)
Proportion of enrollees who **Always received care when it was needed right away**. (source: CAHPS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	289 (0.554) *0.567 (0.051)*	404 (0.616) *0.642 (0.045)*	*13.2%*	*0.005*
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	417 (0.548) *0.549 (0.023)*	563 (0.657) *0.642 (0.024)*	*16.9%*	*0.013*
Proportion of enrollees who **Always got an appointment for a check-up or routine care as soon as needed**. (source: CAHPS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	398 (0.518) *0.561 (0.046)*	576 (0.568) *0.629 (0.041)*	*12.1%*	*0.002*
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	627 (0.549) 0.558 (0.018)	755 (0.574) 0.565 (0.017)	1.3%	0.799
Proportion of enrollees who **Always got an appointment to a specialist as soon as needed**. (source: CAHPS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	220 (0.473) 0.404 (0.061)	363 (0.543) 0.467 (0.060)	15.6%	0.090
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	418 (0.519) 0.518 (0.025)	500 (0.556) 0.508 (0.026)	- 1.9%	0.783
Proportion of enrollees who **Always easy to get the care, tests, and treatment needed**. (source: CAHPS)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	442 (0.518) *0.459 (0.042)*	641 (0.623) *0.645 (0.036)*	*40.5%*	*<0.001*
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	576 (0.465) *0.484 (0.018)*	891 (0.597) *0.579 (0.017)*	*19.6%*	*0.001*

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using a logistic regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. [3] Relative percent calculated as (QHP – Medicaid)/Medicaid x 100.
Abbreviations: n=number of persons; LSM=least squares estimated mean; StdErr=standard error of estimated mean.

In Figure 9 we present a graph to depict realized access in the context of the average number of days to first outpatient visit of any kind. We restricted this analysis to enrollees within the General Population (1,981 Medicaid enrollees; 41,198 QHP enrollees) who were enrolled the entire 365 days of 2014. By 30 days of enrollment, 21.2 percent of QHP enrollees had accessed an outpatient visit compared to 8.2 percent of Medicaid enrollees (p<0.001). By 90 days of enrollment, 41.8 percent of QHP enrollees had accessed an outpatient visit compared to 29.6 percent of Medicaid enrollees (p<0.001).

Figure 9. Proportion of Medicaid and QHP Enrollees with a First Outpatient Care Visit, by Day

Adjusted Product-Limit Failure Curves
With 95% Hall-Wellner Bands

% of Enrollees with Visit by
90 Days
Medicaid 29.6%
Commercial QHP 41.8%

% of Enrollees with Visit by
30 Days
Medicaid 8.2%
Commercial QHP 21.2%

Medicaid ———

Commercial QHP ———

Cumulative Probability of Outpatient Visit

Time to Event Duration: First Outpatient Visit (in Days)
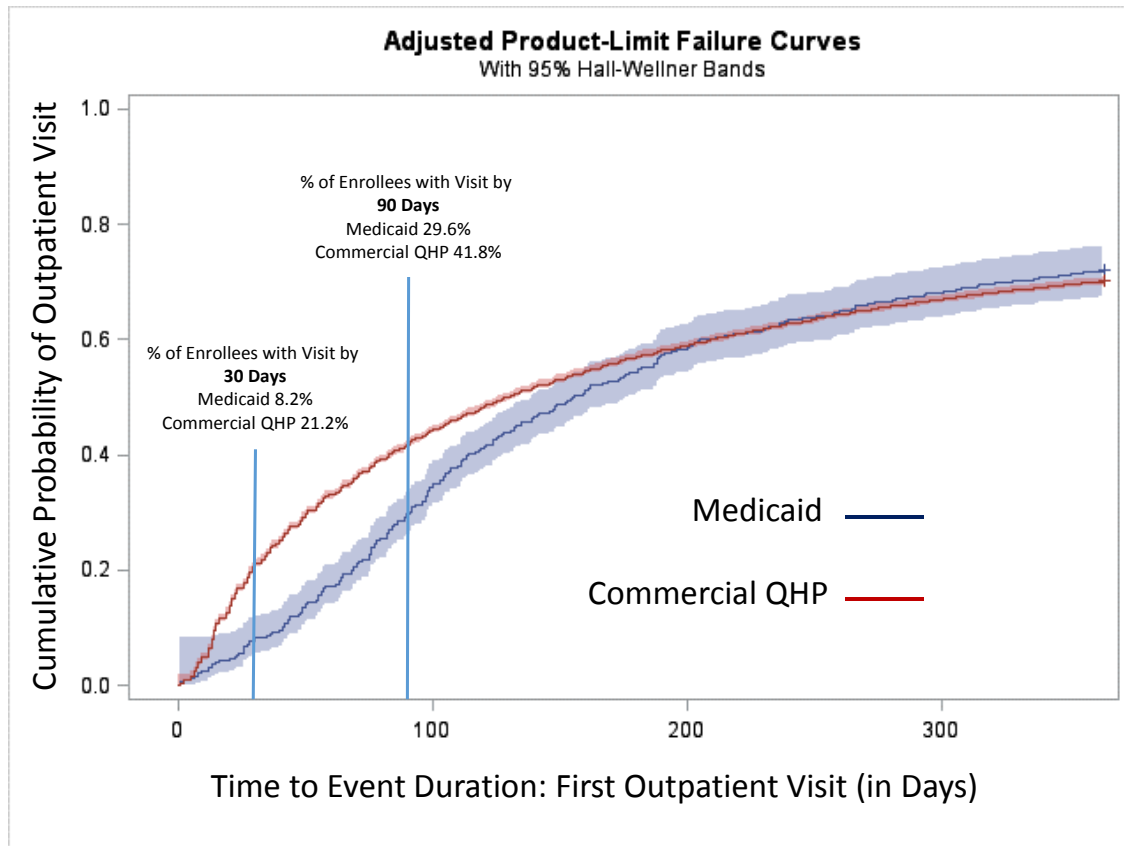
Table 4 compares utilization of ER measures for Medicaid and QHP enrollees in both the General Population and the Higher Needs population. Emergent and non-emergent ER visits were compiled using a commonly used New York University (NYU) algorithm.[31,32] Unassigned ER visits include visits that the algorithm did not assign as emergent or non-emergent (including ER visits for psychiatric, alcohol and substance abuse, etc.).

On three of the four ER measures, a lower proportion of visits were made by QHP enrollees in the General Population and Higher Needs population compared to Medicaid enrollees. These include total ER visits (13.2 percent lower in the General Population and 50.8 percent lower in the Higher Needs population), non-emergent emergency room visits (58.1 percent lower in the General Population and 63.6 percent lower in the Higher Needs population), and unassigned ER visits (9.4 percent lower in the General Population and 67.0 percent lower in the Higher Needs population). For emergent ER visits, QHP enrollees had a higher proportion of use than Medicaid enrollees (122.1 percent higher in the General Population and 51.9 percent higher in the Higher Needs population).

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Table 4. Differences in Utilization of Emergency Room Services between Medicaid and QHP Enrollees

Emergency Room Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value)
Rate of **Total Emergency Room Visits** per 12 months of enrollment. (source: Claims)	Crude (n, mean) [1]Adjusted (LSM, StdErr)	11,006 (1.066) *1.034 (0.025)*	69,499 (0.908) *0.898 (0.016)*	*- 13.2%*	*<0.001*
	Crude (n, mean) [2]Adjusted (LSM, StdErr)	10,893 (1.537) *1.521 (0.050)*	60,031 (0.630) *0.749 (0.062)*	*- 50.8%*	*<0.001*
Rate of **Emergent Emergency Room Visits** per 12 months of enrollment. (source: Claims)	Crude (n, mean) [1]Adjusted (LSM, StdErr)	11,006 (0.153) *0.149 (0.006)*	69,499 (0.345) *0.331 (0.008)*	*122.1%*	*<0.001*
	Crude (n, mean) [2]Adjusted (LSM, StdErr)	10,893 (0.260) *0.210 (0.012)*	60,031 (0.214) *0.319 (0.039)*	*51.9%*	*0.002*
Rate of **Non-Emergent Emergency Room** Visits per 12 months of enrollment. (source: Claims)	Crude (n, mean) [1]Adjusted (LSM, StdErr)	11,006 (0.517) *0.494 (0.017)*	69,499 (0.209) *0.207 (0.006)*	*- 58.1%*	*<0.001*
	Crude (n, mean) [2]Adjusted (LSM, StdErr)	10,893 (0.661) *0.679 (0.028)*	60,031 (0.192) *0.247 (0.029)*	*- 63.6%*	*<0.001*
Rate of **Unassigned-Emergency Room Visits** per 12 months of enrollment. (source: Claims)	Crude (n, mean) [1]Adjusted (LSM, StdErr)	11,006 (0.395) *0.394 (0.013)*	69,499 (0.354) *0.357 (0.008)*	*- 9.4%*	*<0.001*
	Crude (n, mean) [2]Adjusted (LSM, StdErr)	10,893 (0.617) *0.633 (0.027)*	60,031 (0.224) *0.209 (0.023)*	*- 67.0%*	*<0.001*

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using a negative binomial regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. [3] Relative percent calculated as (QHP – Medicaid)/Medicaid x 100.
Abbreviations: n=number of persons; LSM=least squares estimated mean; StdErr=standard error of estimated mean.

Table 5 presents findings for the difference in rates for preventable hospitalizations and all-cause 30-day readmissions. We did not find any differences between QHP and Medicaid enrollees in either the General Population or Higher Needs population.

Table 5. Differences in Rates of Preventable Hospitalizations and Readmissions between Medicaid and QHP Enrollees

Preventable Utilization Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value)
Rate of **Preventable hospitalizations** per 12 months of enrollment. (source: Claims)	Crude (n, mean) [1]Adjusted (LSM, StdErr)	11,006 (0.078) 0.078 (0.004)	69,499 (0.073) 0.073 (0.001)	- 6.4%	0.196
	Crude (n, mean) [2]Adjusted (LSM, StdErr)	10,893 (0.140) 0.088 (0.005)	60,031 (0.050) 0.092 (0.004)	4.5%	0.632
Proportion of enrollees with any **All cause 30-day readmission.** (source: Claims)	Crude (n, mean) [1]Adjusted (LSM, StdErr)	545 (0.117) 0.131 (0.014)	6,369 (0.125) 0.124 (0.005)	- 5.3%	0.669
	Crude (n, mean) [2]Adjusted (LSM, StdErr)	1,363 (0.132) 0.098 (0.011)	2,720 (0.102) 0.114 (0.011)	16.3%	0.400

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using negative binomial (rate) and logistic (proportion) regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. [3] Relative percent calculated as (QHP – Medicaid)/Medicaid x 100.
Abbreviations: n=number of persons; LSM=least squares estimated mean; StdErr=standard error of estimated mean.

Compared to Medicaid enrollees in the Higher Needs population, results in Table 6 show that a higher proportion of QHP enrollees were successful every time in getting transportation to see a personal doctor (11.2 percent higher) or specialist (13.0 percent higher). No differences were found between the General Population Medicaid and QHP enrollees.

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Table 6. Differences in Non-Emergency Transportation between Medicaid and QHP Enrollees

Non-Emergency Transportation Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value)
Proportion of enrollees who **Never did not visit a personal doctor because of lack of transportation.** (source: CAHPS)	Crude (n, proportion)	430 (0.809)	618 (0.793)		
	[1]Adjusted (LSM, StdErr)	0.797 (0.032)	0.786 (0.030)	- 1.4%	0.582
	Crude (n, proportion)	950 (0.811)	1,329 (0.881)		
	[2]Adjusted (LSM, StdErr)	*0.804 (0.020)*	*0.894 (0.018)*	*11.2%*	*0.002*
Proportion of enrollees who **Never did not visit a specialist because of lack of transportation.** (source: CAHPS)	Crude (n, proportion)	197 (0.878)	322 (0.842)		
	[1]Adjusted (LSM, StdErr)	0.875 (0.019)	0.831 (0.013)	- 5.3%	0.069
	Crude (n, proportion)	639 (0.843)	769 (0.905)		
	[2]Adjusted (LSM, StdErr)	*0.814 (0.026)*	*0.920 (0.020)*	*13.0%*	*0.003*

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using a logistic regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. [3] Relative percent calculated as (QHP – Medicaid)/Medicaid x 100.

Abbreviations: n=number of persons; LSM=least squares estimated means; StdErr=standard error of estimated mean.

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2. HCIP beneficiaries will have *equal or better* **care and outcomes** compared with what they would have otherwise had in the Medicaid fee-for-service system over time.

Table 7 compares preventive measures for Medicaid and QHP enrollees in both the General Population and the Higher Needs population. On three of the five measures, QHP enrollees in the General Population were more likely to receive preventive care compared with similar enrollees in Medicaid. Among enrollees with Higher Needs, those in QHPs were more likely to receive each of the preventive measures compared to Medicaid enrollees. Of particular note, for Higher Needs enrollees, a higher proportion of those in a QHP received flu shot or spray by July 1, 2014 than those in Medicaid (19.2 percent higher). In addition, a higher proportion of QHP enrollees received any (14.7 percent higher for the General Population and 60.2 percent for those with Higher Needs) or all (6.3 percent higher for the General Population and 14.3 percent for those with Higher Needs) secondary prevention screenings they were eligible for compared to Medicaid enrollees. For clinical management measures (tertiary prevention), a higher proportion of diabetics enrolled in a QHP received an HbA1C assessment (8.4 percent higher for the General Population and 5.5 percent for those with Higher Needs) but no differences were observed in LDL-c screenings across Medicaid and QHP enrollees in both populations.

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Table 7. Differences in Primary, Secondary, and Tertiary Preventive Health Care between Medicaid and QHP Enrollees

Primary/Secondary/Tertiary Preventive Health Care Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value)
Proportion of enrollees **receiving flu shot or spray** (primary). (source: CAHPS)	Crude (n, proportion)	593 (.287)	861 (0.314)		
	[1]Adjusted (LSM, StdErr)	0.297 (0.031)	0.311 (0.030)	4.7%	0.450
	Crude (n, proportion)	526 (0.397)	702 (0.414)		
	[2]Adjusted (LSM, StdErr)	*0.385 (0.017)*	*0.459 (0.018)*	*19.2%*	*0.008*
Proportion of enrollees who **received at least one eligible screening** (secondary). (source: Claims)	Crude (n, proportion)	9,089 (0.230)	57,460 (0.301)		
	[1]Adjusted (LSM, StdErr)	*0.258 (0.005)*	*0.296 (0.002)*	*14.7%*	*<0.001*
	Crude (n, proportion)	9,591 (0.406)	50,043 (0.394)		
	[2]Adjusted (LSM, StdErr)	*0.412 (0.015)*	*0.660 (0.041)*	*60.2%*	*<0.001*
Proportion of enrollees who **received all eligible screenings** (secondary). (source: Claims)	Crude (n, proportion)	9,089 (0.182)	57,460 (0.163)		
	[1]Adjusted (LSM, StdErr)	*0.158 (0.004)*	*0.168 (0.002)*	*6.3%*	*0.020*
	Crude (n, proportion)	9,591 (0.170)	50,043 (0.208)		
	[2]Adjusted (LSM, StdErr)	*0.203 (0.008)*	*0.232 (0.006)*	*14.3%*	*0.014*
Proportion of **diabetics with evidence of HbA1C assessment** (tertiary). (source: Claims)	Crude (n, proportion)	432 (0.722)	4,225 (0.792)		
	[1]Adjusted (LSM, StdErr)	*0.730 (0.018)*	*0.791 (0.006)*	*8.4%*	*0.001*
	Crude (n, proportion)	1,495 (0.800)	3,966 (0.847)		
	[2]Adjusted (LSM, StdErr)	*0.804 (0.018)*	*0.848(0.010)*	*5.5%*	*0.046*
Proportion of **diabetics with evidence of LDL-c screening** (tertiary). (source: Claims)	Crude (n, proportion)	432 (0.687)	4,225 (0.651)		
	[1]Adjusted (LSM, StdErr)	0.674 (0.019)	0.649 (0.008)	-3.7%	0.247
	Crude (n, proportion)	1,495 (0.681)	3,966 (0.720)		
	[2]Adjusted (LSM, StdErr)	0.695 (0.020)	0.715(0.013)	2.9%	0.476

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using a logistic regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. [3] Relative percent calculated as (QHP – Medicaid)/Medicaid x 100.

Abbreviations: n=number of persons; LSM=least squares estimated mean; StdErr=standard error of estimated mean.

Table 8 presents the proportion of female enrollees who obtained a hysterectomy, and the proportion of all enrollees receiving a cholecystectomy or cardiac catheterization. No differences were observed in the proportion of Medicaid and QHP enrollees that received a hysterectomy or cholecystectomy. In the General Population, a higher proportion (62.5 percent) of QHP enrollees received a cardiac catheterization compared to Medicaid enrollees. No difference was detected between Medicaid and QHP enrollees in the Higher Needs Population.

Table 8. Differences in the Use of Health Care Services between Medicaid and QHP Enrollees

Use of Health Care Services Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value)
Rate of **hysterectomy** per 12 months of enrollment among women. (source: Claims)	Crude (n, proportion)	7,501 (0.011)	39,141 (0.012)		
	[1]Adjusted (LSM, StdErr)	0.011 (0.002)	0.012 (0.001)	9.1%	0.633
	Crude (n, proportion)	6,995 (0.014)	35,812 (0.012)		
	[2]Adjusted (LSM, StdErr)	0.010(0.002)	0.016(0.002)	52.2%	0.083
Rate of **cholecystectomy** per 12 months of enrollment. (source: Claims)	Crude (n, proportion)	11,006 (0.011)	69,499 (0.010)		
	[1]Adjusted (LSM, StdErr)	0.011 (0.001)	0.010 (0.000)	-9.1%	0.304
	Crude (n, proportion)	10,893 (0.022)	60,031 (0.013)		
	[2]Adjusted (LSM, StdErr)	0.021(0.002)	0.016(0.001)	-26.2%	0.053
Rate of **cardiac catheterization** per 12 months of enrollment. (source: Claims)	Crude (n, proportion)	11,006 (0.008)	69,499 (0.013)		
	[1]Adjusted (LSM, StdErr)	*0.008 (0.001)*	*0.013 (0.000)*	*62.5%*	*<0.001*
	Crude (n, proportion)	10,893 (0.036)	60,031 (0.014)		
	[2]Adjusted (LSM, StdErr)	0.026(0.002)	0.028(0.002)	4.5%	0.719

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using a logistic regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. [3] Relative percent calculated as (QHP – Medicaid)/Medicaid x 100.

Abbreviations: n=number of persons; LSM=least squares estimated mean; StdErr=standard error of estimated mean.

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Table 9 presents hospital health services utilization and age-adjusted mortality rates. In the Higher Needs population, QHP enrollees had a lower rate of hospitalizations than Medicaid enrollees (43.2 percent lower) but no difference in average length of stay was observed. In the General Population there was no hospitalization rate difference between QHP and Medicaid enrollees, but of those hospitalized the average length of stay was longer for QHP enrollees compared to Medicaid enrollees (34.5 percent longer).

Table 9. Differences in Hospital Inpatient Stays, Average Length of Stay, and Age-Adjusted Mortality between Medicaid and QHP Enrollees

Use of Health Care Services Indicators	Comparison	Medicaid	QHP	Relative Difference (percent[3])	Statistical Difference (p-value)
Rate of **Hospital discharges** per 12 months of enrollment. (source: Claims)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	11,006 (0.129) 0.129 (0.005)	69,499 (0.123) 0.123 (0.002)	- 4.7%	0.267
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	10,893 (0.234) *0.185 (0.012)*	60,031 (0.082) *0.105 (0.016)*	*- 43.2%*	*0.001*
Average length of stay (source: Claims)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	1,153 (3.01) *3.16 (0.054)*	7,982 (4.32) *4.25 (0.023)*	*34.5%*	*<0.001*
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	2,234 (3.79) 4.15 (0.154)	4,371 (3.75) 4.06 (0.127)	- 2.2%	0.679
Age-Adjusted Mortality Rate per 1,000 (source: Claims)	Crude (n, proportion) [1]Adjusted (LSM, StdErr)	11,006 (0.002) 0.002 (0.000)	69,499 (0.003) 0.003 (0.000)	76.6%	0.152
	Crude (n, proportion) [2]Adjusted (LSM, StdErr)	10,893 (0.005) 0.004 (0.001)	60,031 (0.002) 0.003 (0.001)	- 8.6%	0.786

Notes: [1] Compares traditional Medicaid enrollees and QHP enrollees who did not screen by completing the exceptional health care needs Questionnaire. Adjusted analysis was performed using a logistic regression with stabilized inverse probability of treatment weighting. [2] Compares Medicaid enrollees screened to have exceptional health needs and QHP enrollees screened but not meeting the threshold for exceptional health care needs. Adjusted analysis was performed using regression discontinuity around an exceptional needs screener cut-point. [3] Relative percent calculated as (QHP − Medicaid)/Medicaid x 100.
Abbreviations: n=number of persons; LSM=least squares estimated mean; StdErr=standard error of estimated mean.

<u>**Hypothesis**</u>

3. HCIP beneficiaries will have better **continuity of care** compared with what they would have otherwise had in the Medicaid fee-for-service system over time.

Table 10. Continuous HCIP Enrollment Profile by Month of Enrollment

2014 HCIP New Enrollees by Months of Coverage													
January	February	March	April	May	June	July	August	September	October	November	December	Enrolled	Percent
1	1	1	1	1	1	1	1	1	1	1	1	71,190	32.6
0	1	1	1	1	1	1	1	1	1	1	1	13,204	6.0
0	0	1	1	1	1	1	1	1	1	1	1	10,528	4.8
0	0	0	1	1	1	1	1	1	1	1	1	20,131	9.2
0	0	0	0	1	1	1	1	1	1	1	1	24,227	11.1
0	0	0	0	0	1	1	1	1	1	1	1	15,112	6.9
0	0	0	0	0	0	1	1	1	1	1	1	12,013	5.5
0	0	0	0	0	0	0	1	1	1	1	1	12,741	5.8
0	0	0	0	0	0	0	0	1	1	1	1	7,821	3.6
0	0	0	0	0	0	0	0	0	1	1	1	7,716	3.5
0	0	0	0	0	0	0	0	0	0	1	1	9,965	4.6
0	0	0	0	0	0	0	0	0	0	0	1	3,711	1.7
Total Number and Percentage of HCIP Enrollees Continuously (1) Enrolled												208,359	95.3

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Table 10 presents the number of QHP enrollees with continuous enrollment by enrollment-month cohort (1 indicates enrollment). In total, more than 95 percent of enrollees maintained coverage through December, 2014. Roughly 4.0 percent of HCIP enrollees dropped coverage before the end of 2014 and 0.7 percent experienced a churn episode (data not shown).

Hypothesis

4. Services provided to HCIP beneficiaries will prove to be *cost-effective*.

Differences between the costs of QHP enrollees in commercial premium assistance and those managed through the Medicaid system were expected. To evaluate cost-effective aspects and the impact of the use of premium assistance in this Medicaid expansion, we employed three strategies. First, where possible, we calculated the absolute difference in payment rates between Medicaid FFS and QHPs. Second, we quantified the differences in utilization of aggregate services (e.g., hospitalizations, outpatient visits, etc.). Finally, using self-reported differences in availability of care identified above, we estimated the incremental cost of improved access.

Exploration and characterization of cost differences were required to better understand their association with effect differences in access, utilization, quality, and outcomes described above. Differences in payment rates and utilization were also anticipated between Medicaid and the QHP carriers. Variation between QHP carriers was also expected, but for the purpose of this evaluation, a weighted average of their experience was utilized for the QHP comparison.

To determine cost differences for comparable services, we matched outpatient current procedure terminology (CPT) codes, provider type, and site-of-service variables. Direct comparisons of paid claims following this restriction allowed direct service specific payment differentials to be generated and percent differences quantified. Type-specific provider estimates of the differentials between Medicaid and QHPs were generated for comparison. Finally, an overall cost differential between Medicaid and QHPs was calculated for specified outpatient services.

Table 11 presents actual prices for comparable services in Medicaid FFS and QHPs by provider type.

Table 11. Medicaid and Commercial Payer Price Differences for Outpatient Procedures by Provider Type

Provider Type	Weighted Medicaid Average Price	Weighted QHP Average Price	Absolute Difference	Relative Difference (Percent)
Primary Care Physician	$53.07	$100.67	$47.60	89.69%
Advanced Practice Nurses (APN)	$41.90	$68.19	$26.29	62.75%
Cardiologists	$61.49	$126.36	$64.87	105.49%
General Surgery	$52.74	$109.72	$56.98	108.05%
Obstetrician / Gynecologist (OB/GYN)	$48.84	$92.72	$43.88	89.85%
Oncologist	$62.56	$120.35	$57.79	92.37%
Ophthalmologists	$44.47	$118.05	$73.58	165.46%
Orthopedists	$50.75	$98.23	$47.49	93.57%
Psychologists / Psychiatrists	$44.25	$91.92	$47.67	107.74%

Notes: Weighted QHP and Medicaid Averages Prices were based on the most common CPT procedures billed for outpatient services. Only CPT procedures that were represented both in QHP and Medicaid claims are included in the weighted averages. Relative difference percent calculated as (QHP – Medicaid)/Medicaid x 100.

Examination of all matched payment types for outpatient services represented above resulted in an absolute difference weighted average of approximately 90.3 percent. Less controlled examinations of other major

categories of expense revealed similar dramatic differences in payment. For inpatient hospital stays, average QHP payments were $11,894 per discharge compared to Medicaid payments (with supplemental additions) of $7,778, a 53 percent difference. For ER non-hospitalized visits, average QHP payments were $598 per visit compared to Medicaid payments of $196, a 205 percent difference. Available information on prescription pricing revealed Medicaid with a slightly higher price due to dispensing fees (average of $3 per prescription filled) but due to lack of access to rebate information for either Medicaid or the QHP carriers through their pharmacy benefit managers, this information is likely not reflective of actual experience.

Utilization rates as a component of differential cost also varied between Medicaid and QHP premium assistance. While condition specific comparisons were impractical due to variations claims type and provider identification between the Medicaid and QHP systems. Major categories of service utilization were categorized. Table 12 below displays the utilization rates for Medicaid and QHP events for outpatient visits, hospitalizations, non-hospitalized ER visits, prescriptions, and other claims.

Table 12. Observed Utilization Rates [Per-Member Per-Year (PMPY)] for QHP and Medicaid Enrollees with a Minimum of Six Months Enrollment

Visit Type	Medicaid Rate[1]	QHP Rate[2]
Outpatient	3.854	4.442
Hospitalization	0.129	0.106
ER	1.014	0.731
Other [3]	6.189	6.695
Prescriptions	9.895	17.538

Notes: The total of member months used for all utilization metrics for the Medicaid population were 107,016. The total of member months used for all utilization metrics for the QHP population was 1,270,118. [1]Medicaid rate includes those in traditional Medicaid excluding those Medically Frail. [2] Excludes Medicaid run in person time and Medicaid claim. [3] Other medical claims not classified above (excludes A6000 administrative claims (e.g., PCCM, Transportation) in Medicaid).

Clear and meaningful differences in utilization consistent with observed effects described above are demonstrated. Medicaid enrollees experienced fewer outpatient events and a concurrent higher rate of ER visits and hospitalizations. Importantly, enrollees within QHPs received twice as many prescriptions than their Medicaid counterparts. Because Medicaid utilizes different payment mechanisms and provider codes for select services compared to their QHP counterparts, direct comparison of all services was not feasible. Future efforts to further stratify the "other" category into meaningful service types are anticipated.

These payment rate and utilization differences provide an explanatory window into the effect differences observed between our comparison groups. They also directly contribute to the absolute cost differences and offer the opportunity to explore effect differences between that experienced through premium assistance and that in the Medicaid program.

Using the matched payments described above from the primary care setting, we examined effect differences in perceived access to determine the effect impact associated with payments. Examining differences in utilization between QHP enrollees and their Medicaid counterparts, perceived differences in access reported above were an improvement in access by 13.2 percent for QHP compared to Medicaid in the General Population represented by "always getting care when needed right away". A difference of 16.9 percent was reported for those with increased self-reported health care needs. From the observed 89.7 percent difference in payment rates to primary care outpatient providers, ratios of incremental access increase per payment difference were calculated. For the general population, a 1.48 percent improvement in access per 10 percent increase in payment rate could

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be expected. For those with increased self-reported health care needs, a 1.88 percent improvement in access per 10 percent increase in payment rate could be expected.

d. Cost-Effectiveness

Based upon observed programmatic costs and utilization, PMPM rates for QHP and Medicaid under alternative scenarios were developed. Actual QHP premiums paid represented the cumulative PMPM average of premiums paid to carriers during the first program year. Conversely, actual Medicaid expenditures paid for newly enrolled previously eligible 19-64 year old adults were calculated and expressed as a PMPM (supplemental payments and estimates for marginal administrative costs were included—see Appendix 5 for details). Finally, from observed utilization and payment differences, two models were generated to inform the counterfactual assessment of what Medicaid would have experienced if a traditional expansion had been employed.

PMPM payments were calculated similarly for both QHP and Medicaid enrollees by summing adjudicated claims for the different categories of services and then summing the total months of services for each. Administrative costs were estimated to be an average of 18 percent for commercial carriers, while administrative costs for traditional Medicaid were determined by examining spending across all Department of Human Services categories that were eligible for matching funds from the federal government. The model estimate for commercial PMPMs developed from claims experience was $496.24, a variance of $6.54 from the actual PMPM premium paid. Two models depicted below in Table 13 were pursued to estimate what the QHP enrolled individuals would have cost in the Medicaid program. The first model contained in the Estimate 1 column provides PMPM costs for QHP enrollees under the assumption that payments for services would reflect the prices paid in the Medicaid program. Under this methodology, prices for services were altered to reflect the experience of the traditional Medicaid population, while holding utilization of services for the QHP enrollees constant. The second model similar to the first model contained in the Estimate 2 column adjusted for payment rate differences and utilization differences where known. Allowing utilization of services to change better reflects the experience of the Medicaid enrollees relative to the QHP enrollees.

Table 13. Observed and Estimated PMPM Cost Scenarios for Traditional Medicaid and QHP Enrollees by Service Category

Per Member, Per Month (PMPM) Observed and Estimated Costs					
Service Category	Observed Medicaid	QHP Premiums	Observed QHP	Estimate 1	Estimate 2
Inpatient	$78.37		$105.12	$60.49	$69.10
Prescription Medications	$31.07		$72.02	$34.54	$32.67
Emergency Room	$15.75		$36.40	$12.39	$14.01
Outpatient	$25.54		$46.59	$27.40	$26.40
Other	$65.87		$175.50	$64.51	$64.91
Total Claims	$216.64		$435.63	$199.33	$207.10
Administrative	$55.37		$60.61	$45.63	$45.63
Average PMPM	$272.01[1]	$485.05[2]	$496.24[3]	$244.96[4]	$252.73[5]

Notes: [1] Average PMPM represents loaded (i.e., cost-based reimbursement, supplemental payments, etc.) claims from Traditional Medicaid claims. [2] The average PMPM payment made to QHP carriers, excluding $4.65 attributed to wrap around services. [3] Includes PMPM Administrative costs for Observed QHP claims were set at 18 percent of the total claims paid excluding copayments and deductibles. [4] Average PMPM represents claims costs based on average Medicaid pricing. [5] Average PMPM paid represents claims costs based on average Medicaid pricing and utilization adjustment.

The modeled PMPMs approximated observed PMPMs for both the actual premiums paid [$496.24 estimated compared to $485.05 paid (a 2 percent variance)] for those in the QHPs and the actual expenses inclusive of

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supplemental payments and estimated administration for individuals in Medicaid ($252.73 estimated compared to 272.01 observed, a 7 percent variance). It is important to keep in mind these modeled PMPMs reflect the estimated costs of care for QHP enrollees had they been managed through the existing Medicaid system and experienced effects similar to those reported above. These PMPMs do not reflect any modification of the existing Medicaid program due to rate modifications to achieve necessary access.

e.   Program Impact Simulation

As previously described, Arkansas had one of the lowest Medicaid eligibility thresholds for non-disabled adults in the US (below 17 percent FPL for parent/caretakers only). The result was that a majority of the covered lives were for children, low-income Medicare beneficiaries for long-term services (not medical), limited-benefits for pregnant women and/or family planning services, and Social Security Income (SSI) disabled adults. In 2013, prior to the PPACA expansion, Arkansas Medicaid covered 24,955 non-disabled adults with a full benefit package. In 2014, following PPACA expansion, an additional 267,482 individuals were covered—approximately 17,300 (6.5 percent) previously eligible but newly enrolled; approximately 25,000 (9.3 percent) PPACA eligible but with exceptional heath care needs; and 225,000 (84.2 percent) PPACA eligible with premiums purchased on the individual marketplace. Thus, in 2014 Arkansas Medicaid expanded their non-disabled 19-64 year old population by ten-fold with 84 percent managed externally in the commercial marketplace. Effect comparisons represented above draw on the experience of those newly eligible in either the Medicaid FFS or commercial premium assistance programs during 2014.

Infusion of an additional 267,482 non-disabled 19-64 year olds into the Medicaid system would likely have had systemic effects on the system. Traditional microeconomics suggests that increased demand through the Medicaid program would place increasing price pressure on the rate structure of the existing Medicaid program. Observed differences in payment rates between QHP and Medicaid described above could lead to increased access differences for Medicaid enrollees. Any potential increase in payment rates would necessarily affect not only the new expansion population but also enrollees under the same payment rate schedule across the entire Medicaid program.

To model these potential systemic effects on the Medicaid program, we simulated a budgetary impact analysis of alternative scenarios of inflationary impact on Medicaid's payment structure and rates. We identified all claims paid within 2014 for Medicaid enrollees in the system. We then restricted to individuals whose care would be under payment rates that might be affected (e.g., eliminating individuals age 65 and over where Medicare would be primary major medical payer and children younger than one because of a different rate structure in effect). Additionally, we eliminated payments by provider types not likely to be subject to direct inflationary pressure (e.g., durable medical equipment providers, transportation providers, etc.). We then simulated the incremental effect of inflationary increases in payment rates and the net associated cost impact under three increasingly conservative scenarios: 1) claims associated with potentially wage sensitive services; 2) restricted to claims associated with major medical services; 3) finally, restricted to only claims associated with physician billed services.

Within the budget impact analysis, increasing costs under the alternative scenarios were then converted to a marginal additional PMPM adjustment and applied to the observed Medicaid PMPM described in Table 13 above to project what Medicaid expenditures would have been. These Medicaid projections were then compared to the actual premiums paid for commercial premium assistance to determine if and at what point Medicaid program costs would have exceeded the differential observed between commercial premium assistance and actual Medicaid expenditures.

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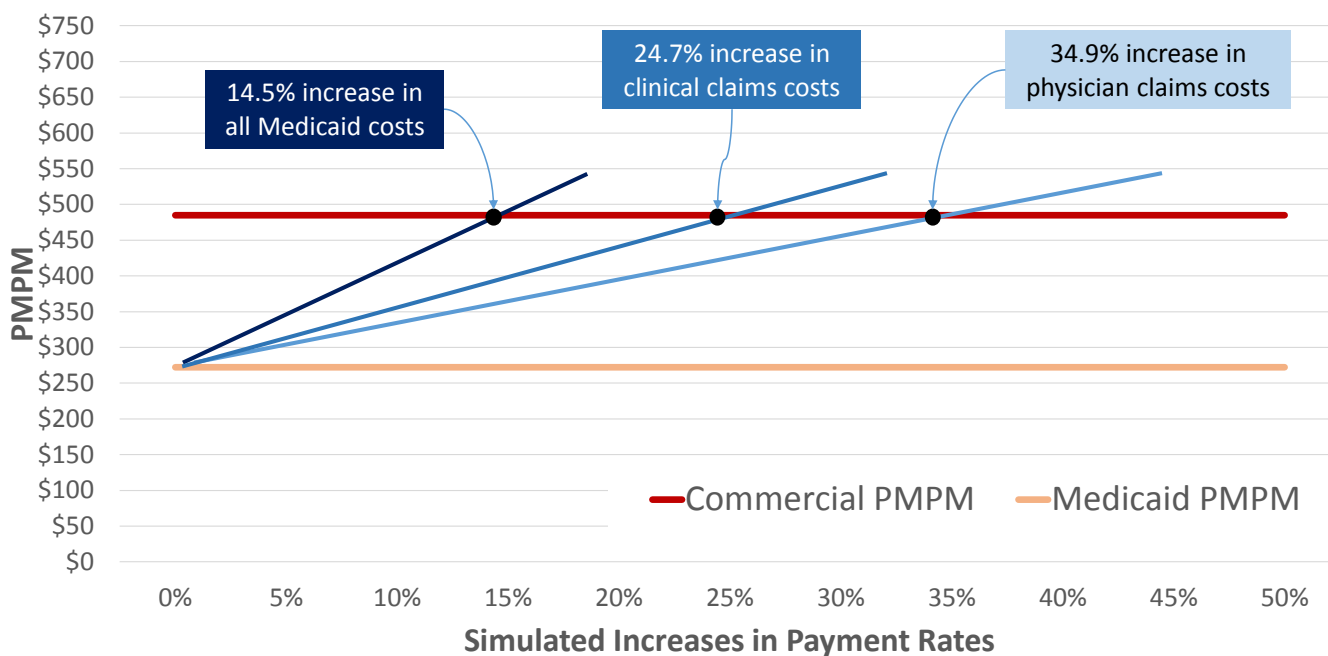
Notes: PMPM expenditures observed for QHPs (premium assistance) and Medicaid with simulated Medicaid costs under incremental increases under a scenario for all claims associated with wages, all claims restricted to major clinical services, all claims restricted to only physician services.

Figure 10 above depicts the alternative scenarios holding actual commercial PMPM ($485.05) and actual Medicaid PMPM ($272.01) constant. The budget impact analysis under the wage sensitive scenario the Medicaid program would achieve budget neutrality if the Medicaid program experienced a 14.5 percent increase in costs. Under the major medical scenario the Medicaid program would achieve budget neutrality at a 24.7 percent increase in clinical claims cost. Lastly, restricting to physician only scenario, budget neutrality would be achieved at a 34.9 percent increase in physician claims costs.

IV. Summary of Findings and Future Evaluation Components

a. Year 1 Program Experience

Arkansas successfully established the Health Care Independence Program (HCIP), commonly referred to as the "Private Option" in 2014 as designed under the Terms and Conditions of the Section 1115 demonstration waiver. Through 2015, the estimated target enrollment population of approximately 250,000 has been met. Approximately 25,000 additional individuals eligible under the PPACA and deemed to have exceptional health care needs are enrolled in the traditional Medicaid program. Finally, approximately 22,000 previously eligible, but newly enrolled individuals, have obtained Medicaid coverage.

Healthcare providers reported both significant clinical and financial effects. Federally qualified community health centers (FQHCs) reported increased success in attaining needed specialty referrals for their clients.[3] The Arkansas

Hospital Association (AHA) reported annualized reductions in uninsured outpatient visits, emergency department visits and admissions by 45.7 percent, 38.8 percent, and 48.7 percent, respectively.[4] The states teaching hospital reported a reduction in uninsured admissions from 16 percent to 3 percent during a similar time period.[5]

The influence on the risk profile and competitiveness of the individual marketplace has been substantive. Representing 84 percent of the covered lives within the individual health insurance marketplace, Medicaid's premium assistance has lowered the average age of the risk pool(s) by approximately ten years. The resulting more favorable risk within the Marketplace has enabled stable premium prices in the first three years of the HCIP. Competitiveness and consumer choice in the Marketplace has increased across the seven market regions in the state. In 2014, three regions had only Arkansas BlueCross BlueShield and BlueCross BlueShield Multistate plans offered. By 2016, five carriers were offering coverage across all seven market regions with one market region having six carriers (the sixth restricted to a single market by Medicaid's purchasing guidance limiting premium assistance to those plans within 10 percent of the second lowest cost silver plan within market region).

For 2014, the estimated budget neutrality cap (BNC) was exceeded during the initial enrollment phase of the program. Enrollment of younger individuals over time affecting net premiums, the rebate of medical-loss ratio (MLR) payments by one carrier not meeting the MLR requirements in 2014, and inflationary expectations built into the BNC estimates have brought cumulative program costs brought the estimated BNC within the 2015 limit of $500.08 per-member per-month (PMPM) and well under the 2016 limit of $525.58 PMPM. Importantly, this evaluation will allow examination of BNC estimates compared to real experience.

b.   Effect Comparisons

1.   Access

A key component in this evaluation is the comparison of qualified health plan (QHP) beneficiary experiences to similar cohorts of new beneficiaries who were enrolled in traditional Medicaid. We employed two strategies— 1) a comparison of individuals from a general population of new QHP enrollees or Medicaid (the General Population); and 2) a quasi-experimental approach to individuals who had self-reported higher previous health care utilization and were assigned to either QHPs or Medicaid (the Higher Needs population). In general, findings observed in the two comparison populations were consistent in direction, with the Higher Needs population producing larger differences between Medicaid and QHP enrollee experiences.

A key component of the demonstration was the degree to which QHP and Medicaid enrollees had access to providers within their respective networks. Access was framed from three perspectives: the geographic presence of providers available to enrollees, the experience of enrollees in attaining access at times of need, and variations in utilization observed between programs.

The location of providers in both the Medicaid and QHP network participation revealed high degrees of geographic access and minimal variation between programs. Both Medicaid and commercial enrollees' networks contained providers who met network adequacy requirements (e.g., 30 minutes from a Primary Care Provider (PCP), 60 minutes from a specialist). More than 98 percent of enrollees in both Medicaid and QHPs had access to a PCP within a 30 minute drive time. For specialists within the General Population comparison population, both programs achieved high levels of geographic access, represented by more than 95 percent of beneficiaries having no more than a 60 minute drive time from the beneficiary's home.

Two unexplained statistically significant access differences were observed with QHP enrollees having slightly higher orthopedic access (98.3 percent of QHP vs 93.7 percent Medicaid enrollees within 60 minutes) and Medicaid enrollees having slightly more oncological access (99.1 percent of Medicaid vs 95.0 percent of QHP enrollees within 60 minutes). No meaningful difference was assigned to these statistical findings.

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These geographic access assessments represent the Medicaid participating providers compared to commercial participating providers for all carriers. Because of Arkansas's "any willing provider"[12] law, requiring insurers to allow any provider willing to accept terms for the class of providers into their networks, assessment across all carriers was deemed appropriate. Future assessment stratified by carrier are anticipated within the final report to determine if between carrier differences were present.

In contrast, from the perspective of the beneficiary at times of need, significant differences were observed in being able to access providers within the networks. Consistently across both the General Population and Higher Needs population, enrollees reported improved access within QHPs. Responding to whether it was "always easy to get care, tests, and treatment needed", 64.5 percent of General Population QHP enrollees responded affirmatively compared to 45.9 percent enrolled in Medicaid (a 40.5 percent relative difference). For individuals with Higher Needs, 57.9 percent of QHP enrollees compared to 48.4 percent of Medicaid enrollees responded affirmatively (a 19.6 percent relative difference). With respect to getting "an appointment for a check-up routine care as soon as needed," enrollees in QHPs reported more accessibility with a 12.1 percent relative difference in the General Population. Improved accessibility was suggested for ease of appointment availability for the General Population, with no differences observed for the Higher Needs population.

Because this was the initiation year of the program and many of the newly enrolled lacked prior insurance coverage, we examined the time to first outpatient visit in the general population for Medicaid and QHP enrollees and found significant differences. Within 30 days of enrollment, 21.2 percent of QHP enrollees had accessed an outpatient visit compared to 8.2 percent of traditional Medicaid enrollees. By 90 days of enrollment, 41.8 percent of QHP enrollees had accessed an outpatient visit compared to 29.6 percent of Medicaid enrollees. These differences are dramatic and consistent with the perceived accessibility reported above from enrolled beneficiaries.

Finally, comparing utilization patterns for ER use and hospitalizations, the impact of access differences reported above are consistently observed for both the General Population and Higher Needs comparison populations. Examining the rate of total ER visits per 12 months of enrollment, Medicaid enrollees experienced a 13.2 percent higher ER visit rate in the general population and a 50.8 percent higher rate in the Higher Needs comparison population.

Differentiating between emergent and non-emergent ER visits by a modified NYU algorithm,[31, 32] programmatic difference were observed. QHP enrollees were much more likely to utilize ER services for emergent care—122.1 percent for the General Population and 51.9 percent for the Higher Needs population. Conversely, non-emergent ER services were much more likely to be utilized by the Medicaid enrollees—58.1 percent higher for the General Population and 63.6 percent higher for the Higher Needs population. These findings were highly statistically significant across all ER comparisons. With respect to hospitalizations, the Higher Needs population demonstrated a 43.2 percent higher hospitalization rate in the Medicaid program than the QHP program with no differences observed in the General Population.

Considering network participation, self-reported perceived access, and patterns of utilization, a profile of the differences between Medicaid and QHP program performance emerges. Beneficiaries are geographically located near providers that have enrolled as a provider in Medicaid or contracted with a QHP to provide services. Geographic access, however, does not equate to beneficiary accessibility. Published studies inclusive of Arkansas providers during the time period reflected in this evaluation has found significant differences across multiple states and specifically Arkansas providers in their acceptance of new patients privately covered by commercial insurance compared to those with Medicaid coverage. In Arkansas, rates for new patient availability of appointments for commercial and Medicaid insurance scenarios were 88.1 percent and 48.7 percent, respectively.[33] Survey information from this 2013 report indicated that fewer practices were accepting patients with Medicaid coverage when compared with private payer sources. This finding combined with responses from

practices indicating that their Medicaid patient population comprises less than 10 percent of all patients suggests that practices were likely limiting the number of patients with Medicaid as the primary payer, particularly given that the Medicaid population comprises 26 percent of the state's population.[34] Combined with the time to first outpatient visit and non-emergent ER use rates, all of our findings suggest individuals in the Medicaid program experience more difficulty accessing care when needed and subsequently seeking care in settings that are both less likely to address unmet needs or successfully establish clinician-patient relationships to manage chronic conditions.[34]

2. Care and Outcomes

Although this evaluation reflects the first year of experience for newly enrolled individuals, examination of quality indicators was undertaken to assess variations in health care quality or outcomes. With a high proportion of the evaluation study population likely not having prior health insurance and due to the time frame (first 12 months of coverage), assessments focused on the proportion of enrollees that received appropriate clinical preventive screenings, the proportion of enrollees that received prophylaxis to prevent influenza, and the proportion of individuals with diabetes that received appropriate management screenings with a HbA1c and/or LDL-c screening test. Evaluation of a more robust set of quality indicators is anticipated as person-time accumulates enabling longer observation periods.

For receipt of preventive screenings, metrics were operationalized both to compare between enrollee groups if any clinical preventive screening was obtained and to compare if all recommended clinical preventive screenings were obtained. Eligible screening events included the following: breast, cervical, colorectal cancers, and cholesterol screening. Across both comparison populations, enrollees in QHPs achieved higher screening rates than their Medicaid counterparts. For any recommended screening event, the difference was 29.6 percent to 25.8 percent in the General Population (a relative difference of 14.7 percent) and 66.0 percent to 41.2 percent (a relative difference off 60.2 percent) in the Higher Needs population. Although still statistically significant, for those receiving all recommended screening events the variation was less pronounced with 16.8 percent vs 15.8 percent in the General Population and 23.2 percent vs 20.3 percent in the Higher Needs population for QHP and Medicaid enrollees, respectively.

With respect to receiving infection prevention through influenza prophylaxis (flu shot or spray), observed differences again favored enrollees in QHPs over those in Medicaid in the Higher Needs population. A flu shot or nasal spray was reported by 45.9 percent of enrollees in a QHP vs 38.5 percent in Medicaid (a 19.2 percent relative difference). While directionally consistent, no statistically significant finding was present in the general population comparison.

For those requiring diabetic clinical management a higher proportion of those enrolled in QHPs received an HbA1C assessment (79.1 percent in General Population and 84.8 percent in Higher Needs population) than those enrolled in Medicaid (73.0 percent in General Population and 80.4 percent in Higher Needs population). No differences were detected in proportions of diabetics receiving LDL-c screenings.

Ancillary findings reflecting the experience of individuals in both comparison groups included assessments of experience with transportation needs and examination for longer-term health outcomes. Significant findings were observed from reported transportation needs for individuals in the Higher Needs population. QHP enrollees reported no transportation barriers to a personal doctor visit 89.4 percent of the time compared with 80.4 percent of the time for Medicaid enrollees (an 11.2 percent relative difference). Transportation barriers and access to specialty visits were not significantly different in the general population. Preventable hospitalizations, readmissions, and age-adjusted mortality showed no variation likely due to this being the first year of enrollee experiences.

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In summarizing and interpreting care and outcomes, it appears that through more accessible and potentially earlier engagement, the QHP enrollees experienced improved primary prevention (flu prophylaxis) and secondary prevention (clinical screenings) than their Medicaid enrollee counterparts. Importantly, for tertiary prevention (diabetic care) the converse was observed. These findings warrant continued observation for differentiated results and further exploration for specific condition impact. In 2014, Medicaid had implemented a Patient Centered Medical Home (PCMH) program within its State Innovation Model (SIM) payment transformation grant from the Centers for Medicaid and Medicare Innovation (CMMI). Within this transformation effort, PCMH providers were eligible for shared savings conditional on achieving targeted levels of quality care for persons with diabetes. Extension of the PCMH program to the QHPs occurred in 2015. Continued evaluation of diabetic care and additional condition specific indicators as person-time accumulates in the demonstration will enable better assessment of program effects and characterization of differences observed.

c.   Program Observations

Differences between the costs of QHP enrollees and those managed through the Medicaid system were expected. Exploration and characterization of cost differences were required to better understand their association with effect differences in access, utilization, quality, and outcomes described above. Differences in payment rates and utilization were also anticipated between Medicaid and the QHP carriers. Variations between QHP carriers are also expected, but for the purpose of this evaluation, weighted averages of their experience are utilized for the commercial comparison.

From effect differences observed above for comparable groups, overall program differences were suggested and indeed observed. Examination of utilization rates for Medicaid and QHP enrollees with a minimum of 6 months of coverage reinforced these findings.

Medicaid enrollees experienced fewer outpatient events and a concurrent higher rate of ER visits and hospitalizations. Importantly, enrollees within QHPs received twice as many prescriptions than their Medicaid counterparts. Because Medicaid utilizes different payment mechanisms and provider codes for select services compared to their QHP counterparts, direct comparison of all services was not feasible. Volume and type of service utilization have the potential to impact program costs and will be monitored over time to assess convergence or divergence in experience.

While volume and type of service utilization is important, variation in payment rates and their potential impact on access, care, and outcomes was a central component of the demonstration waiver justification. We examined direct comparisons of payment differentials between that paid by Medicaid and by QHPs.

Dramatic differences in payment rates were observed with commercial rates consistently exceeding that in the Medicaid program. Physician rates for outpatient services were 90 percent higher when the enrollee was in a QHP compared to their Medicaid counterparts. Primary care physicians had 90 percent higher payment rates under commercial contracts than with the Medicaid payment schedule. Specialist payment differentials ranged from 90 percent for obstetrician/gynecologists to 165 percent for ophthalmologists.

Higher payment rates for hospital services as well as ER events were also observed. For inpatient hospital stays, average commercial payments were $11,894 per discharge compared to Medicaid payments (with supplemental additions) of $7,778, a 53 percent difference. For ER non-hospitalized visits, average commercial payments were $598 per visit compared to Medicaid payments of $196, a 205 percent difference.

Total program cost differences between that of the HCIP enrollees in QHPs and those managed through the Medicaid system were expected. The cumulative weighted average premium paid during 2014 for commercial premium assistance was $485.05 PMPM. For Medicaid expenditures inclusive of supplemental payments and beneficiary related administrative expenses the observed Medicaid expenditures were $272.01 PMPM. This

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$213.04 PMPM difference represents a 78.3 percent difference between the commercial and Medicaid PMPM. This difference largely reflects the variation in provider payments above modified by secondary variations in utilization. This is reflected in the modeling of Medicaid estimates based upon payment rate differences alone ($244.96 PMPM) and in combination with utilization differences ($252.73 PMPM) resulting in estimates within 9.9 percent and 7.1 percent of the observed, respectively.

d.   Simulation of Traditional Medicaid Expansion (The Counterfactual)

Examination of the hypothetical costs of covering the entire expansion population in Arkansas's traditional Medicaid program and the necessary programmatic changes necessary to achieve a similar effect outcome to that experienced through premium assistance is a core component of the demonstration evaluation. Consideration must be given to the existing Medicaid program, its level of network participation, and impact of existing payment rates given effect changes identified through this evaluation. In addition, the price elasticity of the supply of medical providers and their ability and/or willingness to provide for health care needs of the expansion population through the existing Medicaid program must be considered. Finally, if payment rate changes were required to achieve access and quality outcomes what would be the financial impact of those modifications across the entire Medicaid program (e.g., rate changes would apply to all Medicaid rates not only those associated with the PPACA newly eligible)?

As previously described, Arkansas had one of the lowest Medicaid eligibility thresholds for non-disabled adults in the US (below 17 percent FPL for parent/caretakers only). The result was that a majority of the covered lives were for children, low-income Medicare beneficiaries for long-term services (not medical), limited-benefits for pregnant women and/or family planning services, and Social Security Income (SSI) disabled adults. In 2013, prior to the PPACA expansion, Arkansas Medicaid covered 24,955 non-disabled adults with a full benefit package. In 2014, following PPACA expansion, an additional 267,482 individuals were covered—approximately 17,300 (6.5 percent) previously eligible but newly enrolled; approximately 25,000 (9.3 percent) PPACA eligible but with exceptional heath care needs; and 225,000 (84.2 percent) PPACA eligible with premiums purchased on the individual marketplace. Thus, in 2014 Arkansas Medicaid expanded their non-disabled 19-64 year old population by ten-fold with 84 percent managed externally in the commercial marketplace. Effect comparisons represented above draw on the experience of those newly eligible in either the Medicaid FFS or commercial premium assistance programs during 2014.

Infusion of an additional 297,000 non-disabled 19-64 year olds into the Medicaid system would likely have systemic effects on the system. Traditional microeconomics suggests that increased demand through the Medicaid program would place increasing price pressure on the rate structure of the existing Medicaid program.

A recent study of appointment availability for Medicaid beneficiaries, inclusive of those in Arkansas, suggests that increased Medicaid payments result in improved appointment availability.[35] In this study across 10 states, an increase in availability of primary care appointments of 1.25 percent was observed for each 10 percent increase in Medicaid reimbursements. These findings are consistent with our findings internal to this evaluation both for ease of access for receiving needed care and for access with differential ease of receiving needed care and ease of appointment for routine care. Between Medicaid and QHP enrollees in the General Population we observed a 40.5 percent relative difference and for the Higher Needs population a 19.6 percent relative difference for ease of access. Similarly, for ease in ability to get appointment within the general population a 1.36 percent difference was associated with a 10 percent increase in Medicaid reimbursements. Thus, theoretical, peer-reviewed, and internal findings suggest upward price pressure on existing Medicaid payment rates in the counterfactual that would be required to achieve comparable access and potential comparable outcomes to those experienced in the commercial sector.

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Observed differences in payment rates between Medicaid and QHPs described above would plausibly lead to increased access differences for Medicaid beneficiaries. As required by federal rule, it would be unlikely that Arkansas could meet the equal access provision requiring state Medicaid provider payments to be "consistent with efficiency, economy, and quality of care and ... sufficient to enlist enough providers so that care and services are available under the plan at least to the extent that such care and services are available to the general population in the geographic area."[14] Importantly, any potential increase in Medicaid payment rates would necessarily affect not only services for the new expansion population but also services for beneficiaries under the same payment rate schedule across the entire Medicaid program.

The simulated incremental effects of inflationary increases and the associated cost impact were plausible. The three increasingly conservative scenarios provide policy makers with conditions under which necessary increases to achieve equitable access can be considered. They include: 1) claims associated with potentially wage sensitive services; 2) restricted to claims associated with major medical services; 3) finally, restricted to only claims associated with physician billed services.

The base scenario utilized 2014 actual premiums paid for commercial coverage and observed Medicaid costs for Medicaid coverage. Under the wage sensitive scenario the Medicaid program would achieve budget neutrality if the Medicaid program experienced a 14.5 percent increase in costs. Under the major medical scenario the Medicaid program would achieve budget neutrality at a 24.7 percent increase in clinical claims cost. Lastly, restricting to physician only scenario, budget neutrality would be achieved at a 34.9 percent increase in physician claims costs. In actuality, the market would likely require payment modifications much more complex than these scenarios. However, these scenarios provide policy makers with a comparison of budget neutrality estimates based upon actual expenditures.

These results should be viewed with caution for several reasons. First, cost-sharing reduction reconciliation with carriers for 2014 has not been executed and may result in modifications to payments made. In addition, 2014 represented the initiation phase of the program with significant transitions as reflected in enrollment growth. Future assessments during steady state periods may provide more accurate reflections of both programmatic effects and associated costs.

e.   Future Evaluation Components

This report serves as the Interim Report required in the Terms and Conditions of the Section 1115 demonstration waiver. We anticipate subsequent contributions culminating in a Final Report due by the end of 2017. These contributions will include the following:

- Assessment of Continuity of Coverage and Care: Loss of continuity (e.g., attrition and churn) during the period of eligibility redetermination with subsequent disenrollment of individuals, variations in redetermination, transitions to alternative coverage, and loss of coverage will be pursued; Based upon maintenance of coverage, variations in provider continuity will also be explored;
- Comparison of alternative program performance characteristics at steady state: Quality metrics and health outcome assessments that require observation periods beyond a 12 month will be monitored for program variation and health impact;
- Comparison of observed differences within in first program year for explanatory characteristics at steady state: Observed differences in primary prevention (flu prophylaxis), secondary prevention (clinical screenings), and tertiary prevention (HbA1c assessment) in which QHPs had higher performance;
- Focused assessments on select populations will be undertaken: Examination of care for pregnant women and Early Period Screening Diagnosis and Treatment needs of the 19 and 20 year olds (both requiring

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multi-year data for assessment) as well as populations of particular interest (e.g., the mentally ill) will be undertaken;

- Evaluation of the utilization and impact of Health Independence Accounts (HIAs): For participants in the HCIP at or below 100 percent FPL, HIAs were introduced in 2015 through which prepayment of a monthly premium afforded cost-sharing protections for the individual; assessment of participation, utilization, and beneficiary protections will be pursued;

- Assessment of impact on the health insurance marketplace: Ongoing impact of Medicaid's use of commercial premium assistance and its impact on the actuarial risk profile(s), the effect of downward price pressure on Medicaid purchasing strategy (e.g., purchase within 10 percent of lowest cost plan implemented in 2016), and the secondary effects on the U.S. Treasury outlay through tax credits on the Marketplace and stabilizing impact on PPACA compliant plans off the Marketplace;

- Finally, continued assessment of budgetary implications will be pursued: Observational, modeling, and simulation cost estimates will be updated and refined for both the commercial experience and the Medicaid counterfactual scenario(s).

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Appendix 1

Arkansas Evaluation Hypotheses: Proposed & Final Test Indicators

Appendix 1 Arkansas Evaluation Hypotheses: Proposed & Original Test Indicators

Test Metrics for Incorporation in Year 1 HCIP assessment

Note: This is a reduced list from hundreds of candidate indicators that were considered. Due to the short coverage period of 12 months, observations were not able to meet the HEDIS indicator inclusion criteria. For others there were too few observed episodes to be able to detect significant differences across programs. This final listing was approved by the National Advisory Committee as reasonable for presentation in this Interim Report.

1. **Geographic Access**

   1.1. Was network participation in Medicaid equal to that of the qualified health plans (QHPs)?
   - 1.1.1. Proportion of enrollees within 30 miles of at least 1 primary care provider (PCP).
   - 1.1.2. Proportion of enrollees within 60 miles of the following specialists:
     - 1.1.2.1. Cardiologist
     - 1.1.2.2. Obstetrician/Gynecologist
     - 1.1.2.3. Psychiatrist
     - 1.1.2.4. Orthopedist
     - 1.1.2.5. Internist
     - 1.1.2.6. Ophthalmologist
     - 1.1.2.7. Oncologist
     - 1.1.2.8. General Surgeon

2. **Realized Access – Differences in utilization**

   2.1. Was time to engagement with a PCP in Medicaid equal to that in the QHP?
   - 2.1.1. Proportion of enrollees with a PCP visit during first 12 months of continuous enrollment?
   - 2.1.2. Of those with a PCP visit, what were the number of days from enrollment date to first visit with a PCP?
   - 2.1.3. Reengagement with primary care following discharge:
     - 2.1.3.1. Proportion of non-maternal discharges seen in outpatient setting within 10 days
     - 2.1.3.2. Proportion of non-maternal discharges seen in outpatient setting within 30 days

   2.2. Was utilization of frequent procedures in Medicaid equal to that in the QHP? Will require summary indicator stratified by age and gender--HEDIS FSP frequency table
   - 2.2.1. Percutaneous coronary intervention
   - 2.2.2. Cardiac catheterization
   - 2.2.3. Coronary artery bypass graft

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2.3. Was inpatient utilization in Medicaid equal to that in the QHP? Reported separately by medical, surgical, and maternity stratified by age and gender—HEDIS IPU frequency table

    2.3.1. Discharges

    2.3.2. Discharges/1000 member months

    2.3.3. Days

    2.3.4. Days/1000 member months

    2.3.5. Average length of stay

3. Perceived access – the consumers experience

    3.1. Proportion of CAHPS respondents that report obtaining care as soon as needed

    3.2. Primary care—Proportion of CAHPS respondents who report getting an appointment for checkup or routine care as soon as needed

    3.3. Specialty care—Proportion of CAHPS respondents who report getting an appointment specialty care as soon as needed

    3.4. Proportion of CAHPS respondents who report ease of getting care

4. Transportation

    4.1. CAHPS respondents who did not visit their personal doctor in the last 6 months because they could not arrange acceptable transportation

    4.2. CAHPS respondents who did not visit a specialist in the last 6 months because they could not arrange acceptable transportation

5. Clinical quality process measures

    5.1. Were primary prevention efforts in Medicaid equal to that in the QHP?

        5.1.1. CAHPS respondents who had a flu shot or nasal flu spray since 7/1/14

        5.1.2. CAHPS respondents who use tobacco reporting a cessation discussion with provider

    5.2. Did secondary prevention efforts in Medicaid achieve equal results to those in the QHPs?

        5.2.1. Combined screening indicator for age appropriate screens—cervical cancer, breast cancer, colorectal, cholesterol (note deviates from HEDIS):

            5.2.1.1. Proportion of enrollees receiving one or more indicated screening tests.

            5.2.1.2. Proportion of enrollees receiving all indicated screening tests.

    5.3. Were indicators of chronic disease management (tertiary prevention) in Medicaid equal to those in the QHP?

        5.3.1. Diabetes

            5.3.1.1. Proportion of diabetics with evidence of HbA1c assessment?

            5.3.1.2. Proportion of diabetics with evidence of 2 or more HBA1c assessments?

            5.3.1.3. Proportion of diabetics with LDL-c screening?

6. Clinical quality outcome measures

    6.1. Were preventable medical events in Medicaid equal to those in the QHPs?
        6.1.1. Preventable Emergency Department Visits
        6.1.2. Preventable Hospitalizations

    6.2. Were avoidable readmissions in Medicaid equal to those in the QHPs?
        6.2.1. Plan All-cause readmission (non-mental health)

7. Were outcome differences in Medicaid equal to those in the QHPs?

    7.1. Crude and Age adjusted mortality rates

Appendix 2

Arkansas Evaluation Hypotheses

Appendix 2 Arkansas Evaluation Hypotheses

Table 1 below includes a description of each of the original 12 hypotheses outlined in STC #70 that have been re-organized into the following four categories:

Table 1. Evaluation Hypotheses

Arkansas Evaluation Hypotheses	Arkansas Original Terms and Conditions Hypotheses (Section 8, STC 70, #1)
1—Access	
a. Use of PCP/specialist	i. Premium Assistance beneficiaries will have equal or better access to care, including primary care and specialty physician networks and services.
b. Non-emergent ER use	iii. Premium Assistance beneficiaries will have lower non-emergent use of emergency room services.
c. Preventable ER	vii. Premium Assistance beneficiaries will have lower rates of potentially preventable emergency department and hospital admissions.
d. EPSDT	ix. Premium Assistance beneficiaries who are young adults eligible for EPSDT benefits will have at least as satisfactory and appropriate access to these benefits.
e. Non-emergency transportation	x. Premium Assistance beneficiaries will have appropriate access to non-emergency transportation.
2—Care/outcomes	
a. Preventive and health care services	ii. Premium Assistance beneficiaries will have equal or better access to preventive care services.
b. Experience	viii. Premium Assistance beneficiaries will report equal or better experience in the care provided.
c. Non-emergent ER use*	iii. Premium Assistance beneficiaries will have lower non-emergent use of emergency room services.
d. Preventable ER*	vii. Premium Assistance beneficiaries will have lower rates of potentially preventable emergency department and hospital admissions.

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Arkansas Evaluation Hypotheses	Arkansas Original Terms and Conditions Hypotheses (Section 8, STC 70, #1)

3—Continuity
 	
  a. Gaps in coverage
 	
  b. Continuous access to same health plans
  c. Continuous access to same providers
	iv. Premium Assistance beneficiaries will have fewer gaps in insurance coverage.
	v. Premium Assistance beneficiaries will maintain continuous access to the same health plans, and will maintain continuous access to providers.

4—Cost effectiveness
 	
  a. Admin costs
 	
  b. Reduce premiums
 	
  c. Comparable costs
	vi. Premium Assistance beneficiaries, including those who become eligible for Exchange Marketplace coverage, will have fewer gaps in plan enrollment, improved continuity of care, and resultant lower administrative costs.
	xi. Premium Assistance will reduce overall premium costs in the Exchange Marketplace and will increase quality of care.
	xii. The cost for covering Premium Assistance beneficiaries will be comparable to what the costs would have been for covering the same expansion group in Arkansas Medicaid fee-for-service in accordance with STC 68 on determining cost effectiveness and other requirements in the evaluation design as approved by CMS.

* The outcomes of interest and evaluation approaches associated with hypotheses 2c and 2d are shared with 1b and 1c.

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Appendix 3

Data Processing of Carrier Data

Appendix 3 Data Processing of Carrier Data

A. Overview

Data were obtained from two primary data sources; administrative claims data (Medicaid and commercial Qualified Health Plans (QHPs)) and a member enrollment survey (Consumer Assessment of Healthcare Providers and Systems (CAHPS)). In order to construct variables of interest, these data were supplemented by files from the Department of County Operations (DCO), Arkansas Department of Health (e.g., Vital Death Certificate and Hospital Discharge Data), and the Exceptional Health Care Needs Assessment Questionnaire. Administrative claims for Medicaid and QHP enrollees contained enrollment and all reimbursed care provided by Medicaid and the three commercial health plans from January 1, 2014 through December 31, 2014. The administrative claims data included medical (provider and facility claims), pharmacy claims, member enrollment details, and provider files.

A survey of a sample of traditional Medicaid and QHP enrollees was fielded by the Arkansas Foundation for Medical Care (AFMC) with measures derived from CAHPS, SF-12 and supplementary items. The survey was administered between July and September of 2015 and asked members about their plan experiences over the prior six months. AFMC sent an initial survey, a reminder post card, a second survey for non-responses, and if no response after the second mailing, a follow-up phone survey.

A unique person identifier, called a POID, was generated using characters contained in the enrollee's security number, first/last name, and date of birth. All data were linked by this encrypted identifier.

B. Data Specifications

i. Program Enrollment and Eligibility Data

The Department of Human Services provided Medicaid enrollment data from January 1, 2014 through December 31, 2014. This data was used to identify enrollees in the traditional Medicaid population and those assigned to Medicaid with exceptional needs. Medicaid enrollment data was then integrated with enrollment data received from each of the QHPs including Blue Cross Blue Shield, Ambetter, and QualChoice.

QHP assignment was validated using Department of Human Services fiscal expenditure data. This file included all subsidized premiums paid by Medicaid for each QHP enrollee from January 2014 through March 2015.

ii. Medical and Pharmacy Claims

Administrative claims for Medicaid and QHP enrollees were obtained from all reimbursed care provided by Medicaid and the three QHPs from January 1, 2014 through December 31, 2014. The administrative claims data included medical (provider and facility claims), pharmacy claims, member enrollment details, and provider files.

   a. Medicaid

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Department of Human Services Medicaid medical and pharmacy claims files were used to assess utilization and cost in the traditional Medicaid population and those assigned to Medicaid with exceptional needs. These data were in Medicaid Management Information Systems standard format and layout. All claims received were adjudicated and non-voided.

b. Qualified Health Plans (Blue Cross Blue Shield, Ambetter, and QualChoice)

QHP medical and pharmacy claims files for QHP enrollees were used to identify cost and utilization of services. Each QHP was asked to provide this data in the EDGE server layout, a standardized layout used for reporting to the Centers for Medicare and Medicaid Services (CMS). All claims received were adjudicated and non-voided. Difficulty obtaining all QualChoice data elements required for analyses necessitated deferring the inclusion of their beneficiaries to a later date.

iii. Arkansas Department of Health

The Arkansas Department of Health Vital Statistics database was used to obtain mortality files in addition to Hospital discharge records covering the time period of January 1, 2013 through December 31, 2014. Mortality files were used to estimate death rates. Additionally, hospital discharge data was used in calculations for cost effectiveness supplemental payment allocations.

iv. Income Eligibility Determination

Thirteen (13) data files were received from the DCO containing all available eligibility and enrollment data for Medicaid and QHPs covering the time period of January 1, 2011 through December 31, 2014. A key feature of these data was the income determination levels of each enrollee at the time of application that was used in survey sample strata creation and other analyses.

v. Consumer Assessment of Health Plans Survey (CAHPS) data

Nationwide experience with CAHPS has led to important new insights into patient experiences regarding care for both the Medicaid and the commercially insured populations. Various CAHPS surveys are available to gauge consumer and patient experience with health care services and cover important topics including quality of care, access to care, and experience with care. Surveys are available in the public domain.

The AFMC is the current contractor that collects CAHPS data for the Arkansas Medicaid program every two years. In our evaluation, we contracted with AFMC to field a modified CAHPS survey in the third quarter of 2015. AFMC sent an initial survey, a reminder post card, a second survey for non-responses, and if no response after the second mailing, a follow up phone survey.

We included questions to be able to address access to and availability of services, consistency of care providers and networks, use of primary and specialty care services, and experience with care. In addition, we included questions from the 12-item Short Form Health Survey (SF12)[1] to determine physical and mental health standardized scores.

In order to attain reasonable power to detect differences between Medicaid and QHP enrollees in responses to CAHPS questions we oversampled sub-populations that formed comparison and distinct groups of interest. In addition, we sampled a representative portion of the traditional Medicaid enrollees. The cooperation rate for the survey was 26.4 percent and a representative response rate was received across sub-populations of interest. Details on the CAHPS sampling strategy can be found in Appendix 7.

vi. GIS processed Provider-Enrollee distance measures data

To determine geographic access of Medicaid and HCIP enrollees to providers we contracted with the Center for Advanced Spatial Technologies (CAST) at the University of Arkansas, J. William Fulbright College of Arts and Sciences. Medicaid and QHP enrollee addresses were obtained as well as in-network provider address lists. Enrollee and provider addresses were geocoded. Distances between enrollees and in-network providers were measured in both 15 minute travel time and 15 mile distance increments. For enrollees in a QHP, additional

access metrics were calculated to determine if they had access to out-of-network, as well as in-network providers.

For the purpose of this evaluation we defined adequate access if an enrollee resided within 30 minutes travel time of a primary care physician or 60 minutes of a specialist. Specialty access was calculated for each of orthopedics, ophthalmology, obstetrician-gynecologist, oncology, surgical, psychology, and cardiology. More details on methods used by the CAST team can be found in Appendix 8.

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Appendix 4

Analytical Data Preparation

Appendix 4 Analytical Data Preparation

Arkansas Medicaid enrollment files for calendar years 2012, 2013 and 2014 were used to exclude enrollees of non-interest and identify the study population. Enrollees that did not meet each of the following criteria were excluded:

- At least 19 and less than 65 years of age on December 31st, 2014;
- Enrolled in a Medicaid or HCIP category of enrollment for at least one month in 2014 with a maximum gap of one day;
- Not dually enrolled with a Medicare benefit;
- Not enrolled in a full-benefit Medicaid plan between January 1st, 2013 and October 15th, 2013;
- Not enrolled exclusively in a limited benefit category of enrollment (i.e. Family Planning Coverage) between January 1, 2014 and December 31, 2014.

The resulting subset of 224,212 newly covered individuals in aid categories 20, 25, or 06 with premium assistance in calendar year 2014 were further considered for inclusion in the study population.

Figure 1 below outlines the continued study population development including further exclusions made to obtain the final analytical data set containing 151,429 enrollees. Two important exclusions that should be highlighted are those members with QualChoice coverage and those with additional coverage discrepancies. QualChoice had Arkansas Insurance Department (AID) restrictions on enrollment within the marketplace during 2014 and thus had a small overall share of eligibility enrollees. Due to the size of their population and data quality issues with their carrier files, these members (n = 1,191) were excluded from our analyzable study population at this time. Enrollees with coverage discrepancies were also removed from analytical consideration. A majority of these were eligible for commercial qualified health plan (QHP) coverage but never transitioned into a commercial plan. Approximately one-half of those with an identified discrepancy in program assignment self-identified as having Native American decent. In future analysis, we will explore this population in more detail however for this report, they were removed from the analyzable study population.

The general comparison sample groups used in the stabilized inverse probability of treatment weighting methodology are in boxes highlighted in blue. The higher needs comparison group used in the regression discontinuity models comparing those that were assigned to Medicaid or a QHP based on the medical needs assessment screener score are in boxes highlighted in red. It should be noted for each of the 151,429 enrollees in our analytical study population, we included a rural/urban designation using rural-urban commuting area (RUCA) classifications,[1] health care services utilization variables, as well as constructed fields to represent access, experience, and outcomes indicators.

Figure 1. Analytical Data Preparation

Total 2014 newly covered 20/25/06 individuals in premium assistance
N = 224,212

Exclude those who died before time frame of analysis or with missing Gender information
N = 35

Exclude persons with less than 6 months continuous enrollment with a maximum 13 days allowable gap
N = 58,239

Exclude due to Prior Medicaid Coverage or eligibility within Traditional Medicaid population
N = 394

N=165,544

Exclude persons with more than 1 switch between aid categories or a switch from Commercial to Medicaid
N = 1,677

N = 163,867

Exclude due to Qualchoice Coverage
N = 1,191

Exclude those auto-frail (Frailty score >= 1)
N = 7,070

Exclude those with Coverage Discrepancies (I.e. Premium Assistance members who never transitioned to Commercial Coverage or were frail and placed in Commercial coverage)
N = 4,177

Analyzable Study Population
N = 151,429

Expansion Population "06"

General Population Traditional Medicaid N = 11,006

Higher Needs Medicaid N = 10,893

Commercial Coverage
N=129,530

Higher Needs QHP N = 60,031

General Population QHP N = 69,499

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Reference

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Appendix 5

Supplemental Payments, Claims Loading Process, and Per Member Per Month Logic

Appendix 5 Supplemental Payments, Claims Loading Process, and Per Member Per Month Logic

The cost analysis focused on a comparison of health services provided to commercial qualified health plan (QHP) enrollees in the Health Care Independence Program (HCIP) premium assistance program relative to health service provision under a traditional Medicaid Fee-for-Service (FFS) program. The analysis required an assessment of the costs of services provided under the two alternatives that can be compared to assessments of access, effectiveness, and quality outcome measures. Our main hypothesis was that the provision of health services through QHPs results in higher per member per month (PMPM) costs (payments) relative to traditional Medicaid, but quality and access would be rated higher by enrollees in a QHP. Policy makers generally believe and evidence suggests that access to health care services is improved within state Medicaid programs when payments for primary care services increase.[1,2]

If our hypothesis is confirmed, the findings provide information for policy-makers to evaluate the trade-offs between the cost of care, access to health services, and the quality of services provided. In all of our discussions of cost, we follow the health services literature and define cost as the amount paid on behalf of beneficiaries by insurance or Medicaid payers plus the amount paid by the beneficiary.

In order to obtain a per member per month cost (PMPM) we used the claims data provided by Medicaid and QHPs. As claims data are limited to claims paid, we had to adjust claims for PMPM calculations to include important supplemental payments made by the Medicaid program to providers. Providers in Arkansas receive payment based on upper payment limits (UPL) and cost-based reimbursement from the state Medicaid program. We define supplemental payments as any payment made for utilization of services that were not paid through claims. Total supplemental payments exceeded $468 million dollars in fiscal year 2014 when disproportionate share payments are included. As these payments are made for services provided, they should be incorporated into the cost of claims paid, rather than treated as an administrative cost allocated across all beneficiaries. The process for measuring supplemental payments and allocating them to claims is discussed below.

Both UPL payments and cost-based reimbursement for inpatient and hospital outpatient services were identified for every hospital receiving them from the Division of Medicaid Services (DMS). As there is inconsistent use of cost-reports and different resource pools for allocating supplemental payments to generate payment algorithms, UPL and cost-based reimbursement were averaged across four categories of hospitals: academic (UAMS), private, critical access, and public hospitals. Specifics of this allocation are contained in Table 1. Allocation of inpatient supplemental payment was straightforward as these payments are based on discharges and not days. However, allocation of outpatient hospital supplemental payments proved difficult to identify and as such were also allocated with inpatient hospitalizations. Sensitivity analysis were performed to test the effect of adding hospital outpatient to inpatient claims.

Table 1. Allocation for 2014 Supplemental Payments by Hospital Category

Hospital Category	Inpatient UPL/Discharge	Outpatient UPL/Discharge	Cost-Based Reimbursement	Total Supplement
Academic (UAMS)	$ 1,886.01	$ -	$ 1,148.83	$ 3,034.84
Private	$ 2,359.93	$ 650.39	$ 19.67	$ 3,029.99
Critical Access	$ 3,153.26	$ 1,831.44	$ 5,144.69	$ 10,129.40
Public	$ 4,832.88	$ -	$ -	$ 4,832.88
Average	$ 3,058.02	$ 620.46	$ 1,578.30	$ 5,256.78

Total costs were calculated as the sum of claims cost plus administrative costs for both Medicaid and QHPs. For Medicaid administrative costs as depicted in Table 2, we identified expenditures for services across all agencies associated with Medicaid that received matching funds from the federal government. We also identified other payments made by DMS that could not be included in claims such as physician payments for rate adjustment, case management services, contracts, and payments for quality improvement initiatives.

Table 2. Administrative Costs for 2014

Administrative Cost	Non-fixed	Fixed	Others	Non-fixed and Fixed	All costs
64.10 Base and Waivers	$305,022,449				
21 CHIP		$1,675,440			
IQI payment	$2,300,000				
64.10's Net		$5,511,915			
Disproportionate Share to Hospitals		$70,900,000			
Graduate Medical Education		$8,160,000			
Physician rate adjustment (UAMS)	$35,700,000				
Physician Services	$37,999,596				
Prescription Drug - Clawback			$42,398,618		
Case Management	$9,619,919				
Payment to FQHC	$5,678,667				
Total	$396,320631	$ 84,571,915	$ 42,398,617	$480,892,546	$ 523,291,164
PMPM Admin	$45.63	$9.74		$ 55.37	$ 60.25

PMPM= Total administrative cost/Total enrollee months in MDC (excluding 06 commercial months).

Calculation of Per Member Per Month Payments

This section describes the calculation of per member per month (PMPM) payments made by the Arkansas Medicaid program for services provided to people in one of our study groups – newly insured parents with incomes at or below 17 percent of the federal poverty limit (FPL). People in this group received traditional Medicaid benefits that did not change through Medicaid expansion. Given the benefit structure and population, we report in this section actual service utilization and payment

measures including PMPM payments for the 151,429 enrollees in our analytical sample – all of whom had at least six months of coverage. Payments were categorized as inpatient, outpatient emergency room (ER) visits, outpatient physician visits, prescription drugs, and other services that fell outside these categories.

Utilization and payment of services are presented using the following measures: the percentage of enrollees that use the service category, the amount of spending for the service category conditional on having positive spending (or the probability of positive spending), the average spending on the category conditional on having positive spending, and per person spending defined as total spending for the category divided by the number of enrollees in the group. PMPM payment was calculated by dividing average payment per person by average member months. Per member per year (PMPY) payment was calculated by multiplying PMPM payment by 12 months.

Table 3 provides observed payments for traditional Medicaid and QHP enrollees on a per member per month basis by service category, administrative costs, and overall. In addition we present estimates of PMPM payments based on two different methods. PMPM payments were calculated similarly for both traditional Medicaid and QHP enrollees by summing adjudicated claims for the different categories of services and then summing the total months of services for each enrollee. PMPM payments are defined as total payments divided by total months of coverage. Service categories for both traditional Medicaid and QHP enrollees were defined as inpatient, prescription drugs, outpatient ER visits, outpatient physician, and all other services including outpatient ambulatory surgeries, labs, imaging, and other services that could not be assigned. Inpatient services include ER services that resulted in an admission as well as other labs, imaging, and other services that could be identified as occurring during the inpatient hospitalization.

Table 3. Observed and Estimated Per Member Per Month Cost Scenarios for Traditional Medicaid and QHP Enrollees by Service Category

Per Member Per Month (PMPM) Observed and Estimated Costs					
Service Category	Observed Medicaid	Commercial Premiums	Observed Commercial	Estimate 1	Estimate 2
Inpatient	$78.37		$105.12	$60.49	$69.10
Prescription Medications	$31.07		$72.02	$34.54	$32.67
Emergency Room	$15.75		$36.40	$12.39	$14.01
Outpatient	$25.54		$46.59	$27.40	$26.40
Other	$65.87		$175.50	$64.51	$64.91
Total Claims	$216.64		$435.63	$199.33	$207.10
Administrative	$55.37		$60.61	$45.63	$45.63
Average PMPM	$272.01[1]	$485.05[2]	$496.24[3]	$244.96[4]	$252.73[5]

Notes: [1] Average PMPM represents loaded (i.e., cost-based reimbursement, supplemental payments, etc.) claims from Traditional Medicaid claims. [2] The average PMPM payment made to QHPs, excluding $4.65 attributed to wrap around services. [3] Includes PMPM Administrative costs for Observed Commercial claims were set at 18 percent of the total claims paid excluding copayments and deductibles. [4] Average PMPM represents claims costs based on average Medicaid pricing. [5] Average PMPM paid represents claims costs based on average Medicaid pricing and utilization adjustment.

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Column 1 (Observed Medicaid) provides PMPM payments for enrollees in traditional Medicaid that had incomes below 17 percent of the FPL. PMPM payments were much lower than for QHP enrollees because of the differences in prices paid for services between the two programs. The largest difference in PMPM payments were found in the other category suggesting the need for a greater understanding of spending in this category across the two programs. Administrative costs for traditional Medicaid were based on an exhaustive examination of spending across all Department of Human Services categories that were eligible for matching funds from the federal government. Spending on disproportionate share adjustments and Graduate Medical Education were included as these are paid by the Medicaid program to deliver services. Total administrative spending was divided by total enrollee member months excluding QHP enrollees to generate PMPM payments for administrative services ($55.37).

Column 3 (Observed Commercial) of Table 3 shows that PMPM payments for enrollees in a QHP incurred $435.63 in payments per month with the majority of payments incurred for inpatient and other services. Total payments included administrative loading costs that were estimated to be 18 percent of total claims paid ($60.61 PMPM) resulting in total monthly payments of $496.24.

Column 4 (Estimate 1) provides PMPM costs for QHP enrollees under the assumption that payments for services would reflect the prices paid in the Medicaid program. Under this methodology, prices for services were altered to reflect the experience of the traditional Medicaid population, while holding utilization of services for the QHP enrollees constant. Allowing prices to change for the QHP enrollees substantially reduced estimated PMPM expenditures with the largest change occurring for other services and inpatient services. Administrative payments were calculated by excluding payments that would not change irrespective of how the program was financed. DSH payments and GME payments would not change with a change in volume following the implementation of HCIP and were considered fixed costs. Calculating administrative payments for only services associated with the volume of the program led to a reduction in administrative payments of approximately $10 PMPM. Total payments were estimated to be $244.96 PMPM.

Finally, Column 5 (Estimate 2) provides a similar method for calculating PMPM payments as Methodology 1 except that utilization of services is allowed to change to better reflect the experience of the Medicaid enrollees relative to the QHP enrollees. Medicaid enrollees were more likely to have been hospitalized and more likely to use the ER. We calculated utilization differences as approximately 50 percent differences between the programs to generate the PMPM payments. Administrative payments did not change. Under this approach, changing utilization has little impact on overall PMPM payments with the exception of inpatient services. Approximately 6.5 percent of QHP enrollees were hospitalized compared to over 8 percent of Medicaid enrollees and resulted in a PMPM change in payments of less than $9. Clearly, prices influence PMPM payments in the HCIP program relative to the Medicaid program.

References

[1] Decker SL. Medicaid Physician Fees and the Quality of Medical Care of Medicaid Patients in the USA. Rev Econ Household (2007). 5:95-112.

[2] Pauly MV. Lessons to Improve the Efficiency and Equity of Health Reform. Hastings Center Report (2012). 42(5):21-24.

Appendix 6

Enrollment Timeline, Pent-Up Demand, and Analytic Data Demographic Profiles

Appendix 6 Enrollment Timeline, Pent-Up Demand, and Analytic Data Demographic Profiles

We first present a summary profile of enrollment by month (Tables 1 and 2). While we limited the analytical population to those that had at least 6 months of coverage within a Medicaid or commercial qualified health plan (QHP), not all enrollees were enrolled for 12 months. In our comparisons between Medicaid and QHP enrollees, we adjust health service utilization rates to account for the number of months to use these services. As such, rates are presented based on 12 months of enrollment. To ascertain if utilization in 12 months is mostly driven through pent-up demand in early months for newly available services we present a table of monthly utilization by resource use (Table 3). Finally, we present a demographic overview of the Claims and CAHPS populations under study in our analyses (Tables 4 and 5).

Table 1. Coverage Timeline by 2014 Month of Enrollment

Month	Traditional Medicaid (Aid categories 20/25)	HCIP QHP Premium Assistance and Medicaid Exceptional Health Needs Enrollees	Total Newly Enrolled Beneficiaries
January	2,917	92,985	95,902
February	2,946	27,534	30,480
March	1,536	17,334	18,870
April	1,118	11,376	12,494
May	1,507	14,280	15,787
June	901	6,701	7,602
July	1,106	6,924	8,030
August	1,393	10,541	11,934
September	1,048	5,688	6,736
October	1,141	6,652	7,793
November	845	4,471	5,316
December	676	2,592	3,268
Total	**17,134**	**207,078**	**224,212**

Table 2. Coverage Timeline by Medicaid Program and QHPs, by 2014 Month of Enrollment

| 2014 Month | Medicaid | | QHP | | | | Expansion Total |
	Traditional Medicaid	Exceptional Needs	Non-Exceptional Needs	Blue Cross Blue Shield	Ambetter	QualChoice	
January	2,917	8,404	34,357	39,583	9,538	1,103	92,985
February	2,946	3,279	24,251	3	0	1	27,534
March	1,536	1,862	15,467	3	0	2	17,334
April	1,118	1,187	10,183	3	2	1	11,376
May	1,507	1,383	12,870	11	4	12	14,280
June	901	730	5,964	4	3	0	6,701
July	1,106	810	6,103	9	1	1	6,924
August	1,393	973	9,563	4	0	1	10,541
September	1,048	698	4,983	0	0	7	5,688
October	1,141	612	6,034	1	0	5	6,652
November	845	114	4,351	2	0	4	4,471
December	676	1	2,591	0	0	0	2,592
Total	**17,134**	**20,053**	**136,717**	**39,623**	**9,548**	**1,137**	**207,078**

Notes: QHP enrollees and Medicaid enrollees with exceptional needs represent the expansion total.
Abbreviations: QHP = Qualified Health Plan

Table 3. Pent-Up Demand for Medical Services and Prescription Medications, Medicaid and QHP Enrollees, 2014.

| Month | Medicaid | | | | Commercial | | | |
	# of Enrollees	# with Medical Claims	# with Prescription Claims	Total Claims	# of Enrollees	# with Medical Claims	# with Prescription Claims	Total Claims
January	36,034	7,422	5,547	12,969	50,453	16,375	15,635	32,010
February	55,249	12,056	10,349	22,405	60,812	20,250	21,001	41,251
March	64,751	17,079	15,485	32,564	70,031	24,180	26,201	50,381
April	62,346	19,120	17,796	36,916	89,579	32,990	35,017	68,007
May	51,186	17,485	17,192	34,677	112,652	39,041	42,807	81,848
June	53,170	17,550	17,467	35,017	121,628	41,479	46,212	87,691
July	50,981	18,075	18,261	36,336	131,089	45,759	51,620	97,379
August	53,400	18,806	19,455	38,261	141,489	47,712	54,792	102,504
September	54,177	19,892	20,866	40,758	147,438	51,137	58,181	109,318
October	54,669	20,844	21,811	42,655	153,546	55,536	61,680	117,216
November	51,795	19,350	21,194	40,544	163,166	52,387	60,936	113,323
December	54,474	20,792	22,876	43,668	166,314	56,677	66,701	123,378

Notes: December Medicaid (54,474) and QHP (166,314) enrollment numbers do not add up to 224,212 due to within year attrition.

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Table 4. Traditional Medicaid and QHP Enrollees Who Did Not Complete the Exceptional Health Care Needs Assessment Questionnaire, Analytical Population Demographic Profiles, 2014.

Variable	Category	General Population			
		Claims		CAHPS	
		Medicaid N=11,006	Commercial N=69,499	Medicaid N=648	Commercial N=895
Age	19 - 35	6,494 (59.0)	29,420 (42.3)	300 (46.3)	281 (31.4)
	36 - 50	3,794 (34.5)	23,817 (34.3)	276 (42.6)	365 (40.8)
	51 - 64	718 (6.5)	16,262 (23.4)	72 (11.1)	249 (27.8)
Gender	Female	7,501 (68.2)	39,141 (56.3)	470 (72.5)	609 (68.0)
	Male	3,505 (31.8)	30,358 (43.7)	178 (27.5)	286 (32.0)
Race/Ethnicity	White	6,852 (62.3)	38,187 (54.9)	391 (60.3)	545 (60.1)
	Black	2,349 (21.3)	22,421 (32.3)	123 (19.0)	273 (30.5)
	Hispanic	333 (3.0)	1,758 (2.5)	24 (3.7)	24 (2.7)
	Other	1,472 (13.4)	7,133 (10.3)	110 (17.0)	53 (5.9)
Parent Status	Non-Parent	3,340 (30.3)	41,862 (60.2)	71 (11.0)	310 (34.6)
	Parent	7,547 (68.6)	27,498 (39.6)	577 (89.04)	585 (65.4)
	Undetermined	119 (1.1)	139 (0.2)		
Marital Status	Not Married			376 (58.0)	550 (61.5)
	Married			266 (41.1)	321 (35.9)
	Unknown			6 (0.9)	24 (2.7)
Education Status	≤ HS			378 (58.3)	618 (69.1)
	> HS			262 (40.4)	264 (29.5)
	Unknown			8 (1.2)	13 (1.5)
Worked for Pay in 4 weeks prior to survey	No			338 (52.2)	409 (45.7)
	Yes			280 (43.2)	446 (49.8)
	Unknown			30 (4.6)	40 (4.5)
BMI Category	Underweight			12 (1.9)	15 (1.7)
	Normal			136 (21.0)	191 (21.3)
	Overweight			150 (23.1)	217 (24.2)
	Obese			171 (26.4)	246 (27.5)
	Ext Obese			56 (8.6)	79 (8.8)
	Unknown			123 (19)	147 (16.4)

Notes: Enrollees with Undetermined parental status were not included in the CAHPS sampling frame.
Abbreviations: CAHPS = Consumer Assessment of Healthcare Providers and System survey; HS = High School; BMI = Body Mass Index; Ext Obese = Extremely Obese (BMI > 40).

Table 5. Exceptional Heath Care Needs Medicaid Enrollees and QHP Enrollees who Completed the Exceptional Health Care Needs Assessment Questionnaire, Analytical Population Demographic Profiles, 2014.

| | | Higher Needs | | | |
| | | Claims | | CAHPS | |
Variable	Category	Medicaid N=10,893	Commercial N=60,031	Medicaid N=599	Commercial N=869
Age	19 - 35	3,611 (33.1)	25,480 (42.4)	285 (47.6)	275 (31.6)
	36 - 50	3,921 (36.0)	18,427 (30.7)	245 (40.9)	357 (41.1)
	51 - 64	3,361 (30.9)	16,124 (26.9)	69 (11.5)	237 (27.3)
Gender	Female	6,995 (64.2)	35,812 (59.7)	436 (72.8)	591 (68.0)
	Male	3,898 (35.8)	24,219 (40.3)	163 (27.2)	278 (32.0)
Race/Ethnicity	White	7,681 (70.5)	38,618 (64.3)	367 (61.3)	529 (60.9)
	Black	1,805 (16.6)	11,037 (18.4)	117 (19.5)	267 (30.7)
	Hispanic	162 (1.5)	1,181 (2.0)	20 (3.3)	23 (2.6)
	Other	1,245 (11.4)	9,195 (15.3)	95 (15.9)	50 (5.8)
Parent Status	Non-Parent	7,336 (67.3)	37,395 (62.3)	63 (10.5)	297 (34.2)
	Parent	3,508 (32.2)	22,559 (37.6)	536 (89.5)	572 (65.8)
	Unknown	49 (0.4)	77 (0.1)		
Marital Status	Not Married			360 (60.1)	536 (61.7)
	Married			234 (39.1)	311 (35.8)
	Unknown			5 (0.8)	22 (2.5)
Education Status	≤ HS			355 (59.3)	602 (69.3)
	> HS			237 (39.6)	255 (29.3)
	Unknown			7 (1.2)	12 (1.4)
Worked for Pay in 4 weeks prior to survey	No			312 (52.1)	399 (45.9)
	Yes			259 (43.2)	432 (49.7)
	Unknown			28 (4.7)	38 (4.4)
BMI Category	Underweight			12 (1.9)	15 (1.7)
	Normal			136 (21.0)	191 (21.3)
	Overweight			150 (23.1)	217 (24.2)
	Obese			171 (26.4)	246 (27.5)
	Ext Obese			56 (8.6)	79 (8.8)
	Unknown			123 (19.0)	147 (16.4)

Notes: Enrollees with Undetermined parental status were not included in the CAHPS sampling frame.
Abbreviations: CAHPS = Consumer Assessment of Healthcare Providers and System survey; HS = High School; BMI = Body Mass Index; Ext Obese = Extremely Obese (BMI > 40).

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Appendix 7

Consumer Assessment of Healthcare Providers and Systems (CAHPS) Sample Size Calculation, Sampling Strategy, and Data Preparation

Appendix 7 Consumer Assessment of Healthcare Providers and Systems (CAHPS) Sample Size Calculation, Sampling Strategy, and Data Preparation

A. Sample Size Calculation

The sample size calculation is based on the algorithm described in Lee and Munk (2008).[1] The calculation assumed a linear regression as following:

$$Y_i = \alpha + \tau T_i + \gamma g(X_i) + \varepsilon_i$$

where T_i is an indicator for receiving coverage under the Private Option and τ therefore estimates the effect of the Private Option at the cut-point compared to the traditional Medicaid. g(Xi) is a function of the rating variable and can accommodate the nonlinear terms of X (such as quadratic or cubic of X) and interactions with T. The sample size calculation is based on detecting a significantly better experience in those enrolled in Private Option plans compared to Medicaid as expected with Arkansas Private Option.

$$Ho: \tau = 0$$

$$Ha: \tau > 0$$

The sample size n can be calculated as following:

$$n = \frac{(1 - R_M^2)(z_{1-\alpha} - z_\beta)^2}{MDES^2 P(1 - P)(1 - R_T^2)}$$

where

n: is the overall sample size of the study.

R_M^2: the proportion of variation in the outcome (Y) predicted by the rating and other covariates included in the RD model.

R_T^2: the proportion of variation in treatment status (T) predicted by the rating and other covariates included in the RD model.

P: is the proportion of sample members in the treatment group.

MDES: minimum detectable (standardized) effect size, calculated as τ/σ, where σ is the standard deviation of Y.

α: desired statistical significance level.

1- β: desired power level.

Under the regression discontinuity (RD) design, treatment assignment is highly correlated with the rating variable because treatment is determined based on rating variable crossing a threshold. Therefore, it is less efficient than a randomized controlled trial (RCT) if everything is the same except the assignment strategy.[1] The relative efficiency (RE) of RCTs compared to a RD design is given by:

$$RE = \frac{1}{1 - R_T^2}$$

This ratio varies from 2.75 to 4 depending on the distribution of the rating variable around the cut-point.[1] For our sample size calculation, we assumed RE=3, which means the RD design would need 3 times as large sample size as the RCT to be able to detect the same MDES. This implies that R_T^2=2/3. We calculated the sample size at a significant level of 0.05 (α=0.05), and a power of 80 percent (β=0.2), and assumed the RD model can explain 20 percent of the variation in Y ($R_M^2 = 0.2$).To account for the nonresponse rates and missing patterns, we used those obtained from a previous 2013 Arkansas Medicaid CAHPS survey.

Sample size calculations were estimated for the global rating of specialist care. The maximum sample size needed to detect a significant MDES from 0.2 to 0.4 for all items is shown below. We choose to focus on this item to generate a more conservative sample size estimate because only about 35 percent had visited a specialist in last 6 months in the 2013 Arkansas Medicaid CAHPS survey. The last column reports the number of individuals needed to sample after accounting for the potential loss due to nonresponse. The results presented assumed a balanced design with equal number of individuals in each group (p=0.5). Sensitivity analyses were conducted using imbalanced design and the overall sample size needed is generally larger. For the subsequent sampling, we chose the sample size required to detect a significant MDES of 0.25 as the target sample size (i.e., n=9,324).

Table 1. Sample size requirement for rating of specialist care

MDES	Assumed Standard Deviation	Assumed Mean Difference	Assumed Mean of Medicaid	Expected Mean of QHP	Assume Missing (No visit and / or no response)	Overall Rate of Complete Surveys	Sample Size	Adjusted for Non-response
0.2	2.20	0.44	8.54	8.98	65%	29%	1,484	14,568
0.25	**2.20**	**0.55**	**8.54**	**9.09**	**65%**	**29%**	**950**	**9,324**
0.3	2.20	0.66	8.54	9.20	65%	29%	659	6,475
0.35	2.20	0.77	8.54	9.31	65%	29%	485	4,757
0.4	2.20	0.88	8.54	9.42	65%	29%	371	3,642

(alpha=0.05, power=0.8, R²m=0.20, RT-sq=2/3)

B. Sampling Strategy

The above sample calculation is based on a parametric approach using all available data. Including all data may increase bias if observations far away from the cut-point are included and they are significantly different from those around the cut-point. Although the local linear regression approach is preferred, sample size determination prior to data acquisition is difficult to assess because the existing methods are largely data driven.

The two procedures recommended for estimating "optimal bandwidth" described in the statistical analysis section are data driven and cannot be used to determine the optimal bandwidth prior to data acquisition. A "rule of thumb of bandwidth" has been proposed by Imbens and Kalyanaraman (2012)[2] that is based on a rectangular kernel. This calculation requires only an estimate of the variance of the rating variable as following:

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$$h_{rot} = 1.84 \cdot S_x \cdot N^{-1/5}$$

where X is the rating variable of interest, $S_x = 1/(N-1) \cdot \sum(X - \bar{X})^2$ and N is the total number of observations in the data set.

For this calculation, we estimated standard deviations using all available data on income and exceptional health care needs assessment Questionnaire scores from the sampling cohort of Medicaid and commercial qualified health plan (QHP) enrollees prepared by ACHI. Within this cohort, there were 36,434 available exceptional health care needs scores from enrollees that satisfied the inclusion and exclusion criteria and had an exceptional health care needs score that was greater than 0.023 and less than 1. To utilize all available information, for this calculation we did not exclude individuals with missing gender, race, or market regions if they had valid scores. Figure 1 shows the distribution of the scores. The estimated standard deviation of the score was 0.1121. Based on this, we estimated the h_{rot} to be 0.0252.

Figure 1. Exceptional Health Care Needs Scores (N=36,434)
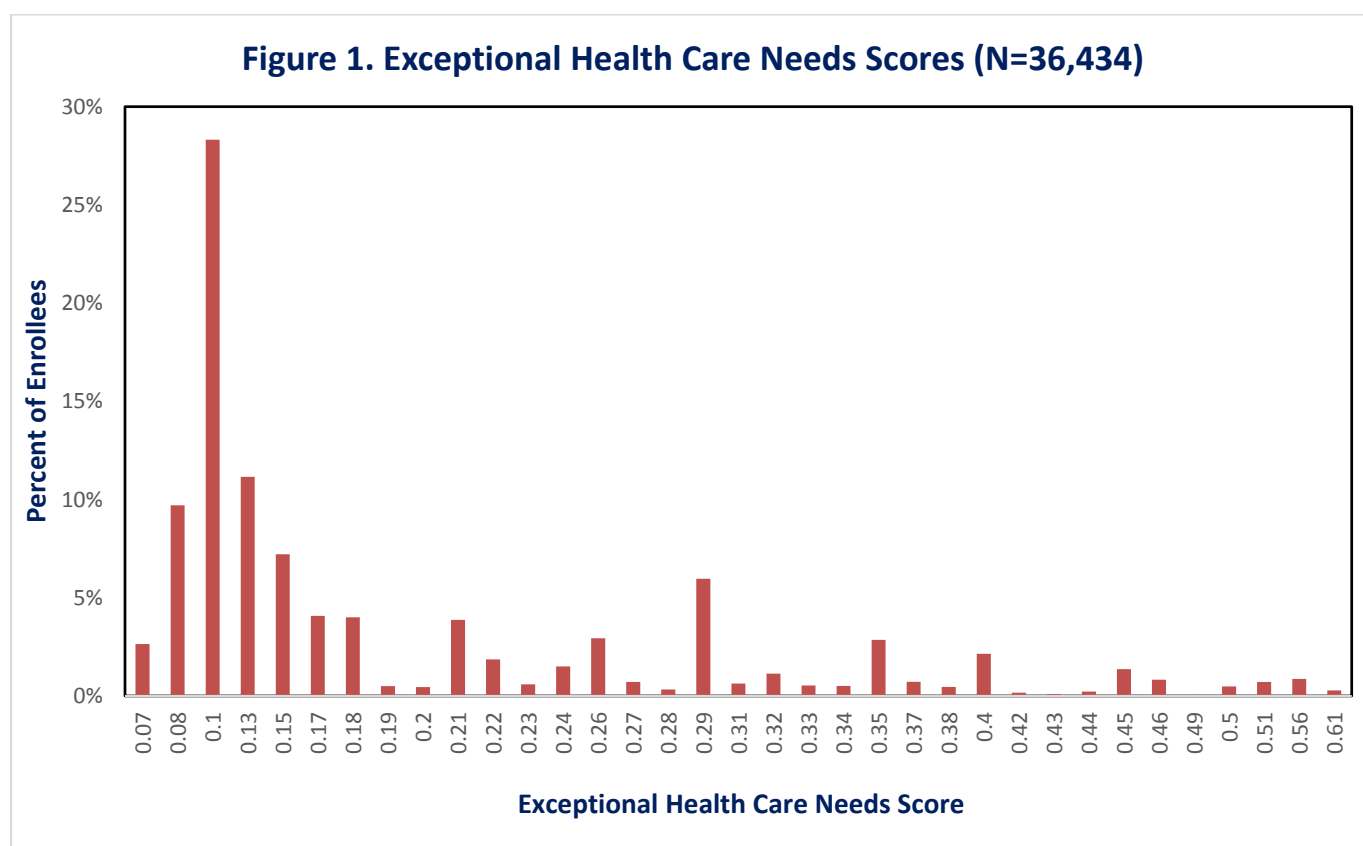
A similar calculation was made for the income criteria comparison. Within the sampling cohort, there were 43,844 individuals who satisfied the inclusion and exclusion criteria and had valid household income and family size information. Income was reported as monthly household income at eligibility determination, allowing for negative values. We then extrapolated this information to 12 months to get the yearly household income. Using family size information, we calculated the household income as the 2014 percentage of the federal poverty limit (FPL). Figure 2 shows the distribution of the

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family income as a percentage of 2014 FPL. The estimated standard deviation of the household income as a percentage of FPL was 0.3973. Based on this, we estimated the h_{rot} to be 0.0862.

Figure 2. Family Income as % of 2014 FPL (N=43,844)
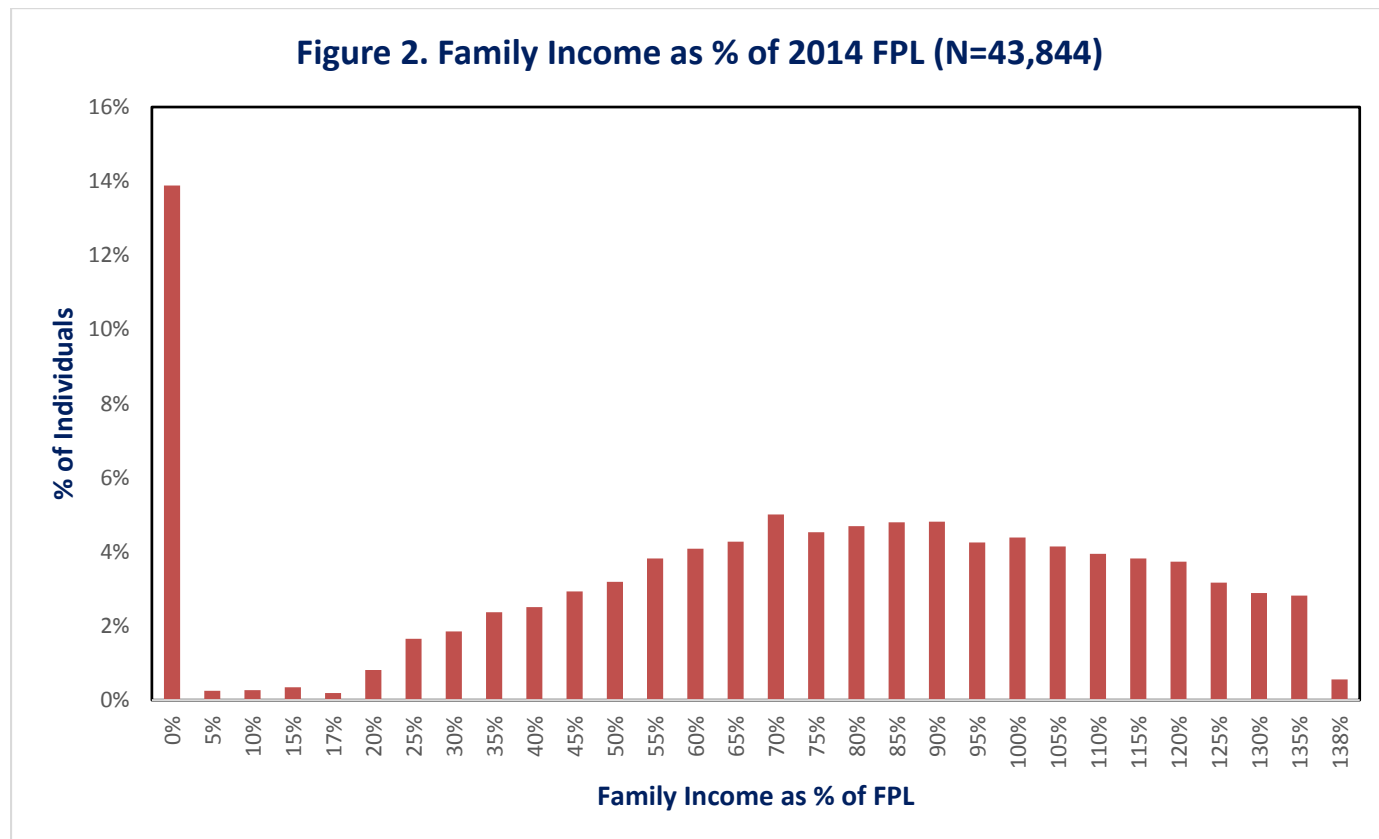
It is important to note that h_{rot} is proposed as the initial estimate for the calculation of optional bandwidth in Imbens and Kalyanaraman (2012)[2] and can underestimate the bandwidth needed.

Based on the role of thumb bandwidth calculation, we surveyed all who are within 2*h_{rot} around the cutpoint to allow potential underestimation of the bandwidth. Therefore, our targeted value range for each comparison was as following:

- For exceptional health care needs threshold criteria, we sampled all individuals with a score in (0.1294, 0.2304).
- For income criteria, we sampled all individuals with family income as percentage of poverty in (0%, 34.24%).

Our strategy was to sample enrollees as close to the threshold as possible. We first sampled within the specified ranges. If there were more enrollees than the targeted sample size within these ranges, we randomly sampled to obtain the target sample size. However, if there were insufficient number of individuals within the specified ranges, we included all individuals with values within these ranges and further sampled from individuals with values just outside of these ranges. This process was repeated until we reached our target sample size.

Table 2 summarizes our sampling strategy for the two comparisons.

Table 2. Summary of CAHPS Sampling Strategies for Income and Exceptional Health Care Needs Criteria Comparisons

Exceptional Health Care Needs Sample			
Required Sample size for MDES=0.25	9,324		
Per group (1:1)	4,662		
ROT Optimal Bandwidth	0.1294	0.2304	
Below 0.1799	n	Sampling	Method
0.15-0.17	3,775	3,775	All
Random sampling from 0.07-0.13	17,317	1,000	Random
Subtotal		4,775	
Above 0.1799	n	Sampling	Method
0.18-0.23	3,785	3,785	All
Random sampling from 0.24-0.29	3,823	1,000	Random
Subtotal		4,785	
Total		9,560	

Income Sample			
Required Sample size for MDES=0.25	9,324		
Per group	4,662		
ROT Optimal Bandwidth	0	0.3424	
17% FPL or less	n	Sampling	Method
0	5,611	4,500	Random
0 – 17 %	420	420	All
Subtotal		4,920	
18% FPL or more	n	Sampling	Method
18% - 35%	2,669	2,669	All
35% - 50%	3,432	2,300	Random
Subtotal		4,969	
Total		9,889	

C. Data Preparation

Arkansas Medicaid enrollment files for calendar years 2012, 2013 and 2014, which included HCIP enrollees, were examined to determine those that were eligible for the survey. In order to be eligible for the survey, enrollees had to be:

- Continuously enrolled in Medicaid or a QHP plan from July 2014 through November 2014. Because enrollment data at the time the CAHPS sample was created was only available through November 2014 at the time of selecting subjects to be sampled in the survey, the last 5 months of enrollment were used based on the premise that the vast majority of those continuously enrolled in the last 5 months of the year would have maintained coverage through the end of the year. A minimum of six months of enrollment was required based on the CAHPS methodology for Medicaid enrollees which asks beneficiaries about their experience with health care services received over the preceding six months.
- Be at least 19 and less than 65 years of age on November 15, 2014.
- Have full coverage under traditional Medicaid or a QHP for at least 6 months in 2014 in Medicaid Aid categories, 06, 20, and 25.
- Not had any prior coverage in aid coverage 06, 20, or 25 in 2013.
- Were not determined to be auto frail (score>=1).
- Did not have missing information on gender, race, or market region.
- Received exceptional health care needs assessment screening but were not in aid category 06.
- Had a valid mailing address.

The resulting subset of enrollees eligible for mailing was 188,213. A random sample of 5,000 enrollees were selected from Medicaid and QHP enrollees separately. Further sampling steps were applied to these samples of enrollees in order to obtain proper income and exceptional health care needs groups for comparison.

The final sample used for CAHPS survey distribution was 29,164. Of those surveyed, 6,568 were completed and valid for analysis. The cooperation rate for the survey was 26.4 percent and a representative response rate was received across populations of interest. The details of this calculation was contained in the Table 3 below.
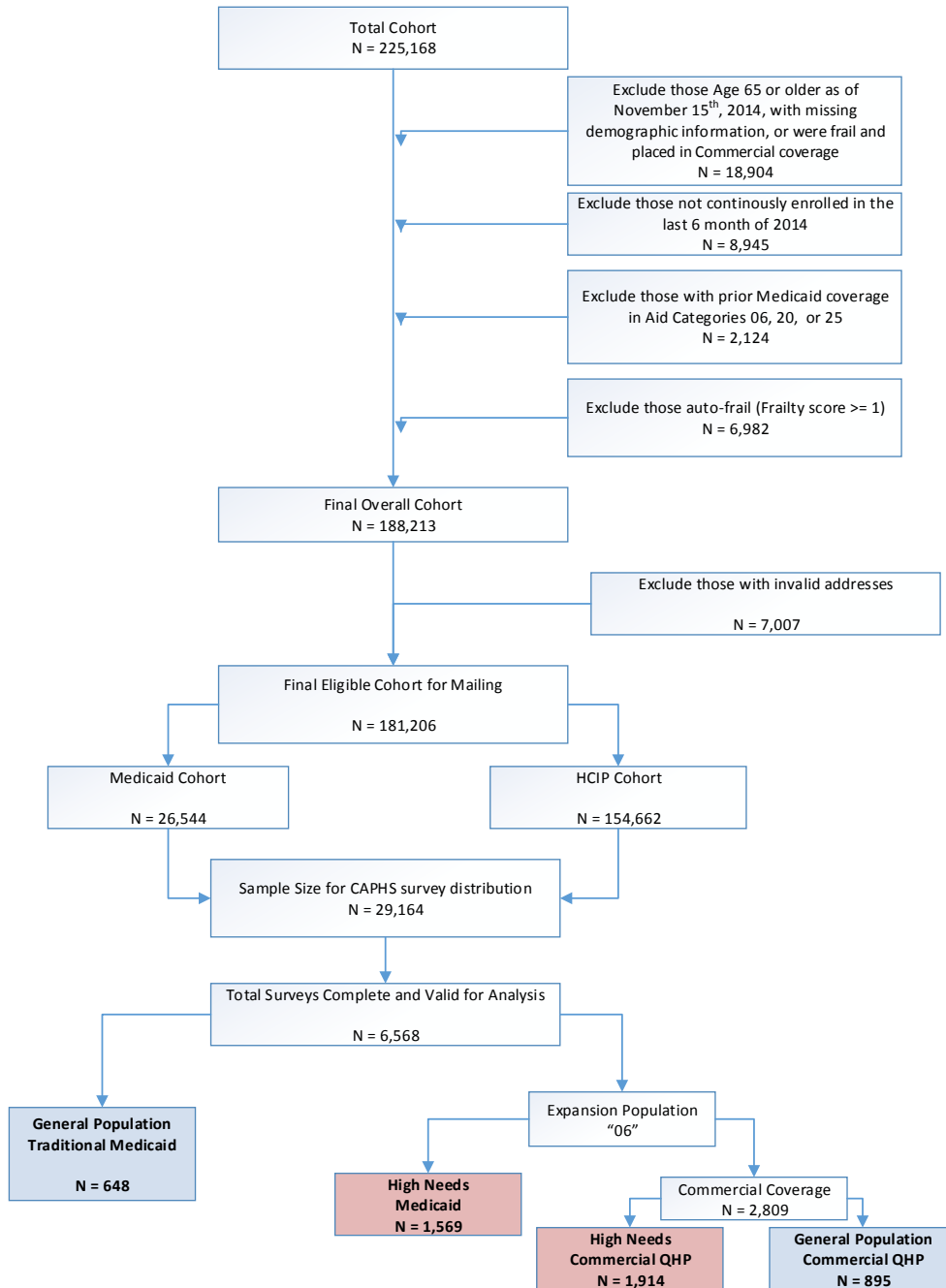
Table 3. Calculation of CAHPS Cooperation Rate

Sample Size	# of pieces received (by mail)	Complete and Valid surveys received by Mail (M10)	Complete and Valid surveys received in phone follow-up (T10)	Ineligibles excluded from analysis (Mail only) (M2 1 + M22 + M24)	Ineligibles excluded from analysis (Phone only) (T21 + T22 + T24)	Total Complete and Valid (M10 +T10)	No forwarding addresses and/or Invalid phone numbers (M23 +T23)	Cooperation rate *
29,164	6,438	6,404	164	25	28	6,568	4,228	26.4%

* **Cooperation rate = (M10 + T10)/ (Total Sample - (M21 + T21 + M22 + T22 + M23 + T23 + M24 + T24))**

Figure 1 below outlines the overall CAHPS study population development. The general comparison sample groups used in the stabilized inverse probability of treatment weighting methodology are in boxes highlighted in blue. The higher need comparison group used in the regression discontinuity models comparing those that were assigned to Medicaid or a QHP based on the medical needs assessment screener score are in boxes highlighted in pink. The groups contained with the CAPHS sample will overlap with those contained within our analytical study population for comparison.

Figure 1. CAPHS Analytical Data Preparation

Total Cohort
N = 225,168

Exclude those Age 65 or older as of November 15th, 2014, with missing demographic information, or were frail and placed in Commercial coverage
N = 18,904

Exclude those not continuously enrolled in the last 6 month of 2014
N = 8,945

Exclude those with prior Medicaid coverage in Aid Categories 06, 20, or 25
N = 2,124

Exclude those auto-frail (Frailty score >= 1)
N = 6,982

Final Overall Cohort
N = 188,213

Exclude those with invalid addresses
N = 7,007

Final Eligible Cohort for Mailing
N = 181,206

Medicaid Cohort
N = 26,544

HCIP Cohort
N = 154,662

Sample Size for CAPHS survey distribution
N = 29,164

Total Surveys Complete and Valid for Analysis
N = 6,568

General Population Traditional Medicaid
N = 648

Expansion Population "06"

High Needs Medicaid
N = 1,569

Commercial Coverage
N = 2,809

High Needs Commercial QHP
N = 1,914

General Population Commercial QHP
N = 895

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[1] Lee M and Munk T. Using Regression Discontinuity Design for Program Evaluation. Journal of the American Statistical Association Joint Statistical Meetings, Section on Survey Research Methods. Denver, CO. 2008.

[2] Imbens GW and Kalyanaraman K. Optimal Bandwidth Choice for the Regression Discontinuity Estimator. Review of Economics and Statistics. 2012;79(3): 933-959.

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Appendix 8
Geographic Information System (GIS) Processing

Appendix 8 Geographic Information System (GIS) Processing

The Center for Advanced Spatial Technologies (CAST) was founded in September 1991 within the University of Arkansas, J. William Fulbright College of Arts and Sciences by the Board of Trustees and the Arkansas Department of Higher Education. Research efforts include multi-disciplinary projects from all around the world. CAST is funded by competitive grants and research proposals from federal and state government offices, universities, non-profit groups, and other organizations.

Medicaid and commercial qualified health plan (QHP) enrollees and provider data (i.e., Blue Cross Blue Shield, Ambetter, and QualChoice) were used to assess network adequacy and perform GIS mapping. For the analysis, "access" was defined as the distances (30 or 60 miles) or time of travel (30 or 60 minutes by passenger automobile) from any enrollee's location to the nearest provider, within an "access ring" offering any of the eight (8) categories of healthcare provider types (primary care, orthopedics, ophthalmology, ob-gyn, oncology, surgical, psychology, and cardiology). These "access rings" were created by computing a total of four (4) distinct travel distances and time-of-travel attributes from each unique provider location (latitude and longitudinal coordinates) for each provider type. From each provider location a set of four miles traveled along the existing (ESRI, 2013) street centerline networks were computed as 'ringed-polygons' at the following distance rings (0-15, 15-30, 30-45, and 45-60 miles).

Only providers that practiced within calendar year 2014 were included in the analyses. It is important to note that as both enrollees and providers had out of state addresses, ACHI and CAST agreed that for this analysis they would compile travel distances or travel-time polygons from any provider that was located within 70-miles of the Arkansas State Boundary. It was not uncommon for enrollees living in proximity to a state border to seek healthcare with a provider across the border.

De-identified data were sent to CAST for analysis. CAST returned to ACHI four provider enrollee data tables for each of Medicaid and the three QHPs. An additional data file combining all commercial enrollees and providers was also prepared and returned. QHP enrollees were encouraged to seek care with a provider inside a QHP, but were not pre-empted from going out-of-network. Within each enrollee dataset fields containing minutes and miles to each provider type was included along with the geocoded locations for the enrollee. A geocoded provider file listing was also returned to ACHI.

More specifics of the data processing steps used by CAST can be found below.

CAST was responsible for the development of the following products for the Arkansas Center for Health Information (ACHI) between October 20, 2015 and February 15, 2016:
1. Geocoded locations (latitude/longitude; WGS84) for all ENROLLEES and PROVIDERS of each of four specified insurance programs,
2. "Access zones" for each of the eight (8) provider "specialties" for each of the four specified insurance programs, based upon both drive-time (minutes) and distance (miles) criteria, plus the

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3. Updated tables for all geocoded ENROLLEES of each of the specified insurance provider, indicating the time/distance zones that enrollees fall within for each PROVIDER specialty.
4. Delivery of GIS results as they were completed.

All work was performed on a physically and electronically secure computer, disconnected from any networks. The specific methods for generating each of these products were as follows:

1. Geocoding and GIS data processing for four (4) Arkansas based Health-care PROVIDER and their current ENROLLEE tables that were obtained by ACHI and provided as .csv files (with schema descriptions) to CAST:

   a. CAST imported each provider and their enrollee tables (while maintaining ACHI generated unique ID's) into an ArcGIS File Geodatabase format.

   b. Geo-Location of each Provider's Facility Address and each of their Enrollee Home Address was assigned using the best available Arkansas GIS Locator(s) as the first-pass for each provider (and their enrollee tables). The GIS Locator used for Arkansas ("GeoStor Composite" address locator, Arkansas GIS Office) leveraged our statewide 911 street address datasets from 2015 that included Street centerline AND address points (any 911 addressed structure), plus the fallback of the 9-digit zip code centroids (e.g. 73722-2356) located within the state of Arkansas. We set the minimum match score of "65" (0-100) for these geocoded addresses. Any original misspellings or address issues found within the source data tables were not corrected by CAST.

   c. For the second-pass of geo-locating any remaining records that were not geocoded within the first pass, we also re-ran the resulting 'non-located' records against ESRI's nation-wide Street centerline network (updated in 2013) so that we could achieve a Street-level geocode for any remaining records that MAY have been missed within Arkansas OR that were located outside of the state boundary of Arkansas.

   d. d. The results of these two (2) attempts to locate each and every record within all four provider and enrollee tables were then MERGED into a common, single database table schema grouped by Health Care Provider. We maintained the original ACHI attributes contained within each table and ADDED VALUE to each of these tables by providing the latitude/longitude coordinates (WGS84) along with additional metadata references such as the: Locator_Name, Status, Score, Match type and the resulting Matching_Address from the GeoLocator used to geocode each record. These additional attributes were appended to each of the original data tables from ACHI which also contained the original data table "unique ID" that was generated in-house by ACHI to help maintain anonymity for all providers and their enrollees.

2. Determination of each Health Care enrollees "ACCESS" to each of the eight (8) categories of Provider-specific services WITHIN and OUTSIDE of each provider network:

   a. ACHI originally defined "access" as the distances (30 or 60 miles) or time of travel (30 or 60 minutes by passenger automobile) from any enrollee's location

to the nearest Provider offering any of the eight (8) categories of Health-care Provider Services (primary care, orthopedics, ophthalmology, ob-gyn, oncology, surgical, psychological, cardiology). CAST proposed to ACHI that we compute a total of four (4) distinct travel distances and time-of-travel attributes from each unique Provider location (latitude/longitude coordinates) for each Provider type. Therefore, from each Provider location a set of 4 MILES-traveled along the existing (ESRI, 2013) street centerline networks were computed as 'ringed-polygons' at the following distance rings (0-15, 15-30, 30-45; 45-60 MILES).

b. The same provider locations and nation-wide street network dataset (ESRI, 2013) was used to ALSO compute a set of TIME-traveled (MINUTES) ringed-polygon buffers out from each provider location; following the same street network dataset. The time-traveled was computed using the ArcGIS Network Analyst extension for each Provider location using 'typical' driving conditions for a passenger car that's traveling the posted speed limits along each street segment as a hypothetical enrollee travels to or from each Provider Location (geocoded Latitude/Longitude coordinate). These travel-time-in-minutes were created in sets of four (4) from each Provider and attributed as: (0-15, 15-30, 30-45, 45-60 minute ringed-polygon geometries).

c. It is important to note that ACHI and CAST agreed that we would ONLY compile travel distances or travel-TIME polygons from any PROVIDER that was located within 70-Miles of the Arkansas State Boundary. It was determined that it is very common for enrollees in a health-care network to travel across state lines to access any of the eight (8) provider specialties as long they were 'in-network' facilities.

d. The resulting set of Provider polygon files enabled us to summarize the following information for each provider.

e. Joining the original PROVIDER services-offered at each Unique Location enabled us to select each "Services Provided" attribute and then "Merge Polygons" (actually DISSOLVE) by travel time or distance so that we would end up with 32 unique GIS data layers (polygon geometry) for each Provider Specialty of the 4 unique Providers (BCBS, MCD, QCH and AMB).

3. Once each of the four (4) unique Providers (BCBS, MCD, QCH and AMB) had their travel DISTANCE buffers (miles) and TIME-OF-TRAVEL (minutes) computed with four (4) distinct zones for each Provider specialty, they could be used to leverage the Spatial Analysis of our geographic information systems by using a "Spatial Selection" of the complete set of ENROLLEE address locations (latitude/longitude geocodes) against each of their corresponding 'in-network' provider SPECIALITY with their travel distance/time merged buffers. We prepared each of the four (4) CAST geocoded provider-ENROLLEE tables with the eight (8) provider services specified by ACHI within this study and we processed all of those enrollee records using this methodology:

a. Add eight (8) attribute columns needed to store each provider specialty (long integer).

b. Update any enrollee addresses that were NOT geocoded to the value "1111". \

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c. Reverse the selection and then update all remaining records to the value "9999" within EACH of the eight (8) ACHI provider specialty columns.

d. We agreed that this value ("9999") would represent any member located BEYOND our cut-off of 60-miles or 60-minutes travel time from any of the eight (8) provider specialty. Therefore, we pre-populated those values before processing a series of 'spatial selections' between our ENROLLEE (point features) and the full-set of 32 travel polygons grouped by distance and provider specialty (polygon feature classes).

e. For each ENROLLEE table we would methodically work through each of the eight (8) provider specialty TYPES using a SELECT BY LOCATION command and working our way from the GREATEST distance or time; INWARD towards the nearest/shortest travel time. Each enrollee record would be OVERWRITTEN or updated with ONE of these 4 values (60, 45, 30, 15), which would indicate (depending upon the ENROLLEE table (MILES or MINUTES) the quickest 'level of access' each enrollee has to ANY provider within their Health-Care network for each of the eight (8) specialty types.

4. Resulting Data Delivery: The four (4) provider enrollee data tables were delivered as .csv and .xlsx formats to ACHI using a secure FTP protocol and within AES-256 encryption applied. Within each provider dataset a MINUTES and MILES traveled tables for each of the original enrollee records were provided with a supporting CODE BOOK detailing the attribute columns and attribute values contained within the delivery.

Addendum Appendix A

Statistical Modeling to Assess Effect Differences for Those Assigned to Medicaid and QHPs.

Addendum Appendix A Statistical Modeling to Assess Effect Differences for Those Assigned to Medicaid and QHPs.

STATISTICAL MODELING TO ASSESS EFFECT DIFFERENCES FOR THOSE ASSIGNED TO MEDICAID AND QHPs.

In our evaluation plan we proposed to use regression discontinuity as the statistical method to assess access, quality, and utilization effect differences between beneficiaries assigned to the Medicaid plan and the QHPs. We had two candidate variables on which to use regression discontinuity designs. One was using the continuum of composite scores obtained from the exceptional health care needs assessment Questionnaire. A threshold cut-point was established along the composite scores to identify those with higher risk of exceptional needs and they were then assigned to the Medicaid plan. In addition, the traditional programmatic assignment of enrollees into the traditional Medicaid fee-for-service plan was based on being a parent earning 17 percent or less of FPL. We anticipated using the programmatic income cut-point assignment for a parent subpopulation to be able to fit a series of regression discontinuity models. Preliminary data analyses confirmed that nearly one in three enrollees (30.3 percent) in the traditional Medicaid fee-for-service plan (aid categories 20/25) were not parents (see Table 4 in Appendix 6). Also, many parents who were assigned to a QHP indicated an income of less than 17 percent FPL, with many of these indicating an income of zero dollars. For this reason and lacking the ability to conform to accepted standards for the use of a regression discontinuity design we decided to pursue a different statistical method to compare groups who did not complete an exceptional health care needs assessment Questionnaire but were assigned into one of the Medicaid plan or a QHP.

This document provides an outline of the statistical methods used in producing the results in this report.

Regression Discontinuity Design

Comparison Groups
We included beneficiaries completing the exceptional health care needs assessment Questionnaire and meeting other inclusion criteria detailed in Appendix 4 for claims based metrics and Appendix 7 for CAHPS respondents. This population is labeled as "Higher Needs" and there was a sharp assignment into either the Medicaid or a QHP plan based on the exceptional health care needs assessment composite score. Those completing the Questionnaire and receiving a composite score of 0.18 or higher were all assigned to the Medicaid plan and those with a composite score less than 0.18 selected a QHP. In total, our analytic claims file contained 10,893 assigned to the Medicaid plan and 60,031 assigned to a QHP. For CAHPS, where we oversampled populations that were close to the threshold composite score value of 0.18, our analytic file contained 1,569 assigned to the Medicaid plan and 1,914 assigned to a QHP. Figures 1 and 2 depict the composite score frequencies in the Claims and CAHPS analytic populations.

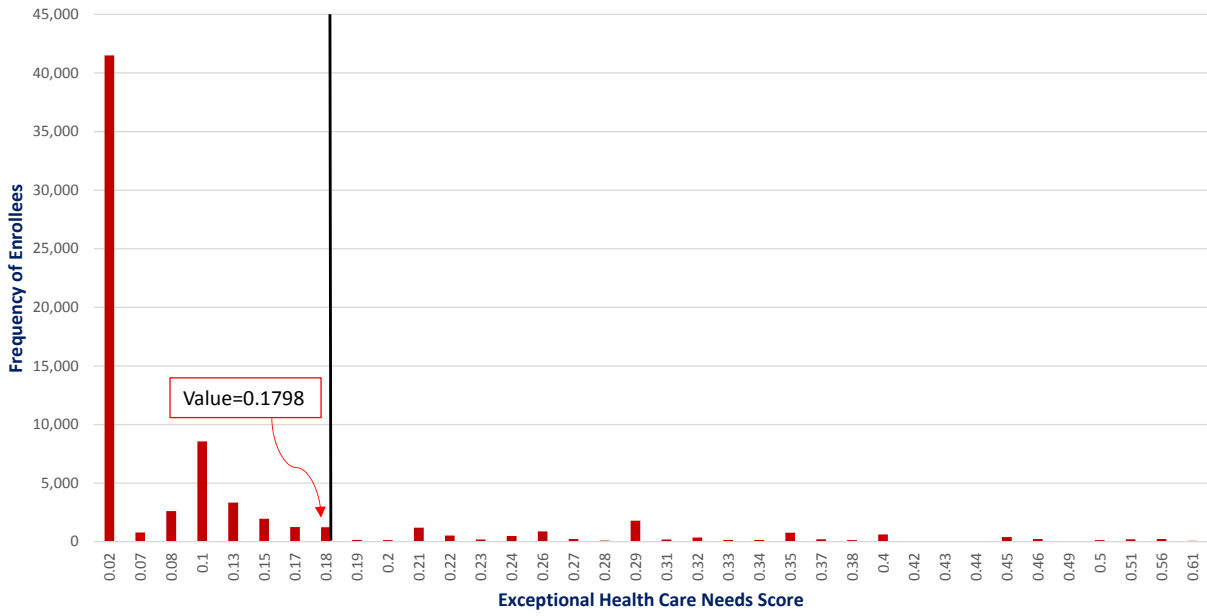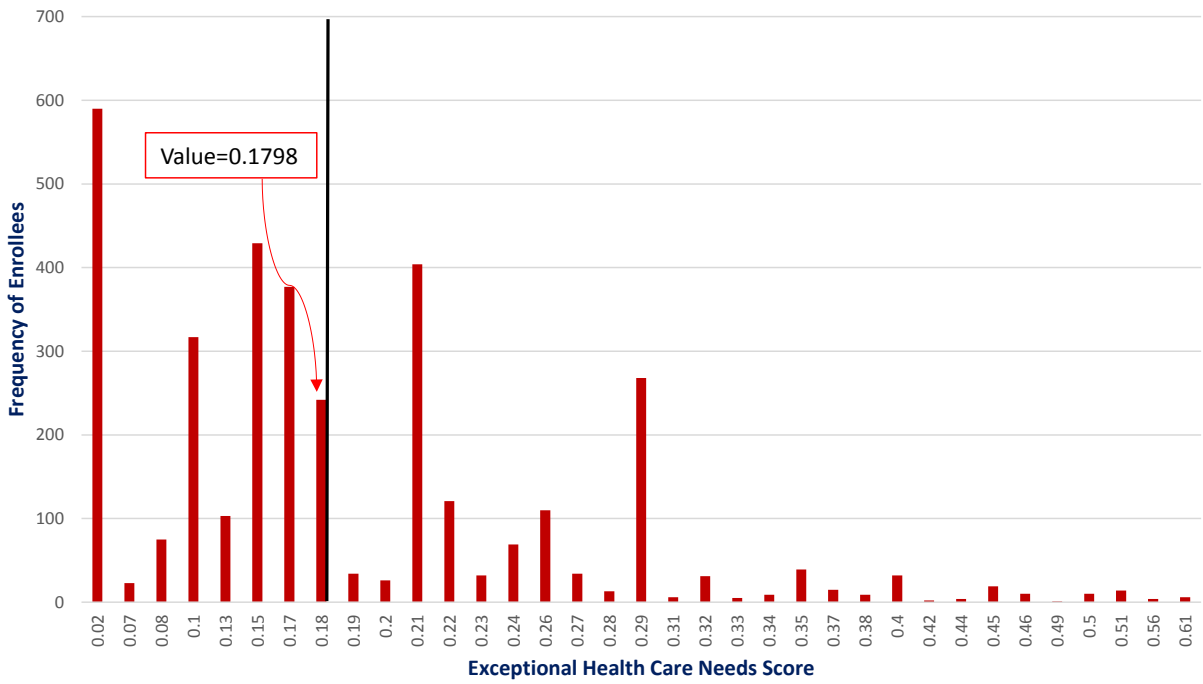**Figure 1. Claims Data - Exceptional Health Care Needs Composite Score (N=70,924)**

Value=0.1798

Figure 2. CAHPS Data - Exceptional Health Care Needs Composite Score (N=3,483)

Value=0.1798

<u>Theoretical Causal Determination of Program Effect</u>
As stated in the report, regression discontinuity is a quasi-experimental design that is increasingly being used in evaluation analyses to test differences attributable to group assignment. This approach is useful when random assignment to groups is not feasible. We adhered to standards for regression discontinuity designs[1] which included:

1) *Treatment assignments were based on a forcing variable* (composite score); units with scores below the cut-off value (0.18) were assigned to the treatment group (QHP) while units with scores on the other side of the cut-off were assigned to the comparison group (Medicaid).

2) *The forcing variable must be ordinal with a sufficient number of unique values* (higher composite scores indicated higher needs).

3) *There must be no factor confounded with the forcing variable.* Overall, those assigned to Medicaid with higher needs were slightly older, female, and white than those assigned to a QHP. Locally around the cut-point, we did not see any differences across these confounders.

<u>Modeling Strategy</u>
Since our outcome variables are discrete, either counts (e.g. number of emergency room visits) or binary (e.g. any readmission within 30 days of an indexed hospitalization) variables, we used the generalized linear regression models with the log of the mean functions modeled as below.

$(i)\ logE(Y_i) = \beta_0 + \beta_1 Z_i + \beta_2 (X_i - X_c)$, where Y_i is the outcome for individual i and Z_i is a dummy variable for the treatment (1=QHP, 0=Medicaid), X_i is the composite score, X_c is the threshold (cut-off) for assignment (0.18), β_1 is the parameter for the effect of association between the outcome and being in a QHP (treatment group) compared to Medicaid (comparison group).

$(ii)\ logE(Y_i) = \beta_0 + \beta_1 Z_i + \beta_2 (X_i - X_c) + \beta_3 Z_i (X_i - X_c)$, is as above and incorporates an interaction between treatment assignment and difference in composite score from the cut-off.

$(iii)\ logE(Y_i) = \beta_0 + \beta_1 Z_i + \beta_2 (X_i - X_c) + \beta_3 Z_i (X_i - X_c) + \beta_4 (X_i - X_c)^2$, is as above and incorporates a quadratic effect in the difference in composite score from the cut-off.

$(iv)\ logE(Y_i) = \beta_0 + \beta_1 Z_i + \beta_2 (X_i - X_c) + \beta_3 Z_i (X_i - X_c) + \beta_4 (X_i - X_c)^2 + \beta_5 Z_i (X_i - X_c)^2$ is as above and incorporates an additional interaction between treatment assignment and the quadratic effect of the difference in composite score from the cut-off.

For each outcome we first began fitting the simplest model (i) and increased the complexity and hierarchy by subsequently adding interactions (ii), higher order polynomials for the centered

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difference in composite score (iii) and additional interaction of treatment assignment with high order polynomials for the centered difference in composite score (iv). We chose the best fitting model from an assessment using the BIC model fit statistic. For counts variables, Poisson or negative binomial distribution was applied with a log-link function. For binary variables, a binomial distribution with a logit link function was used. For outcomes that were affected by duration of tenure with coverage (ranging from 6 to 12 months) we produced estimated rates based on 12 months of coverage. We accomplished this by using an offset option in the model statement of the proc genmod SAS procedure. SAS Enterprise Guide V7.1 HF1 (SAS Institute, Cary, NC) was used to produce the results. An example of the simplest code used to produce results for total emergency room visits for Model (i) is presented below.

```
proc genmod data=out.frailty;
class mcd;
model Num_POID_ER_Visits_Total= fr_score_c mcd/d=negbin link=log offset=log_dur lrci;
   lsmeans mcd/at fr_score_c=0 ilink e diff exp cl alpha=0.05;
run;
```

Models Using Stabilized Inverse Probability of Treatment Weighting

Comparison Groups
We included individuals not completing the health care needs assessment Questionnaire and meeting other inclusion criteria detailed in Appendix 4 for claims based metrics and Appendix 7 for CAHPS respondents. Individuals assigned to the traditional Medicaid fee-for-service plan were mostly parents, and mostly very low income while those assigned to a QHP were, in general, a more equal mixture of parents and individuals with no dependents, with many having higher income levels than those assigned to Medicaid. Since the presumptive assumption of assignment to Medicaid and QHP did not hold to meet standards of using a regression discontinuity design based on parenthood status and an income forcing variable we chose to match the beneficiaries assigned to Medicaid and QHPs by using propensity scores. In total, our analytic claims file contained 11,006 assigned to the General Population Medicaid plan and 69,499 assigned to a General Population QHP. For CAHPS, our analytic file contained 648 assigned to the Medicaid plan and 895 assigned to a QHP.

Theoretical Association Determination of Program Effect
To test for the association of plan assignment and outcome, we mitigated differences in assignment that may have been due to demographic or other factors attributing to the assignment (income was not used). Propensity scores are the probability of being assigned to a treatment group (i.e., a QHP) given a set of underlying characteristics.

Stabilized Inverse Probability of Treatment Weighting (SIPTW)
Following nomenclature outlined in Xu and colleagues[2] we let **z** be a binary outcome where 1 indicates a person was assigned to a QHP and 0 as assignment to the Medicaid plan. X is a vector of

covariates (characteristics) and π indicates for the probability of being assigned to a QHP (the propensity score).

For our claims analytic data the total number (N=80,505) was equal to the 11,006 assigned to Medicaid (n_0) plus 69,499 assigned to a QHP (n_1). The crude calculation of probability of treatment was p = n_1/N = 69,499/80,505 = 0.86. The probability of no treatment, or being assigned to Medicaid was 1-p = 1 – 0.86 = 0.14.

The propensity score associated with an individual (i) was estimated using a logistic regression with the functional form of:

$\pi_i = \frac{\exp(X_i\,\beta)}{1+\exp(X_i\,\beta)}$, where β is a vector of parameters to be fit in the model and associated with the X vectors of covariates (age, gender, race/ethnicity, and parent status for claims data and in addition education, marital, employment, and obesity status for CAHPS data – no data on 2013 health status was available). We used a class statement to produce dummy covariate categories. Inherent in the model is a vector of size *i* of 1's that will produce a parameter (β_0) associated with the intercept for the model. Our logistic regression model had a reasonably high coefficient of determination (c-statistic) of 0.718 for claims data and 0.717 for CAHPS data.

The resulting estimated propensity scores were used to produce inverse proportional treatment weights (IPTW) as follows:

$W_i = \frac{1}{\pi_i}$ *if* $z_i = 1$ *and* $W_i = \frac{1}{1-\pi_i}$ *if* $z_i = 0$, where W_i denotes the IPTW for individual *i*.

Weights for individuals assigned to a QHP (treatment group) with a low propensity score and those assigned to Medicaid with a high propensity score for assignment into a QHP will be high and increase the risk of a Type I error. To reduce this risk we adjusted, or stabilized, the increased pseudo-sample size that was created by using large weights as follows:

$SW_i = \frac{p}{\pi_i}$ *if* $z_i = 1$ *and* $SW_i = \frac{1-p}{1-\pi_i}$ *if* $z_i = 0$, where p is the propensity score and SW_i denotes the SIPTW for individual *i*.

SW_i effectively keep sample sizes used in statistical models to be the same as those had weights not been included and not artificially increasing the risk of a Type I error.

Statistical Models with Treatment Assignment as the Primary Predictor

Statistical models to fit access, quality, and utilization outcomes incorporated the distributional form of the outcome that produced the best fitting model. For example, for the number of total emergency room visits over the course of 12 months we used a negative binomial distribution after demonstrating that this distribution provided a better model fit. The only covariate that was used in

models testing for a treatment effect (primary predictor) was urban/rural designation determined by a RUCA classification (see Appendix 4).

General linear models were fit using SAS Enterprise Guide V7.1 HF1 (SAS Institute, Cary, NC). For outcomes that were affected by duration of tenure with coverage (ranging from 6 to 12 months) we produced estimated rates based on 12 months of coverage. We accomplished this by using an offset option in the model statement of the proc genmod SAS procedure. The SAS statement to produce the results for total emergency room visits is presented below. The stabilized inverse probability of treatment weights were labeled "siptw".

```
proc genmod data = ps_data;
class treatment urban;
model num_poid_er_visits_total=treatment urban/dist=negbin link=log
offset=TotDur_POID_per_yr_ln type1 type3;
weight siptw;
lsmeans treatment/ilink cl alpha=0.05;
run;
```

References

1. Schochet P, Cook T, Deke J, Imbens G, Lockwood JR, Porter J, and Smith J. Standards for Regression Discontinuity Designs. Retrieved from What Works Clearinghouse. Website http://ies.ed.gov/ncee/wwc/pdf/wwc_rd.pdf Accessed 8/6/2015.

2. Xu S, Ross C, Raebel MA, Shetterly S, Blachetter C, and Smith D. Use of stabilized inverse propensity scores as weights to directly estimate relative risk and its confidence intervals. Value Health. 2010;13(2):273–277.