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Changes in Utilization and Health Among Low-Income Adults After Medicaid Expansion or Expanded Private Insurance

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IMPORTANCE Under the Affordable Care Act (ACA), more than 30 states have expanded Medicaid, with some states choosing to expand private insurance instead (the "private option"). In addition, while coverage gains from the ACA's Medicaid expansion are well documented, impacts on utilization and health are unclear.

OBJECTIVE To assess changes in access to care, utilization, and self-reported health among low-income adults in 3 states taking alternative approaches to the ACA.

DESIGN, SETTING, AND PARTICIPANTS Differences-in-differences analysis of survey data from November 2013 through December 2015 of US citizens ages 19 to 64 years with incomes below 138% of the federal poverty level in Kentucky, Arkansas, and Texas (n = 8676). Data analysis was conducted between January and May 2016.

EXPOSURES Medicaid expansion in Kentucky and use of Medicaid funds to purchase private insurance for low-income adults in Arkansas (private option), compared with no expansion in Texas.

MAIN OUTCOMES AND MEASURES Self-reported access to primary care, specialty care, and medications; affordability of care; outpatient, inpatient, and emergency utilization; receiving glucose and cholesterol testing, annual check-up, and care for chronic conditions; quality of care, depression score, and overall health.

RESULTS Among the 3 states included in the study, Arkansas (n=2890), Kentucky (n=2898, and Texas (n=2888), there were no differences in sex, income, or marital status. Respondents from Texas were younger, more urban, and disproportionately Latino compared with those in Arkansas and Kentucky. Significant changes in coverage and access were more apparent in 2015 than in 2014. By 2015, expansion was associated with a 22.7 percentage-point reduction in the uninsured rate compared with nonexpansion ($P < .001$). Expansion was associated with significantly increased access to primary care (12.1 percentage points; $P < .001$), fewer skipped medications due to cost (−11.6 percentage points; $P < .001$), reduced out-of-pocket spending (−29.5%; $P = .02$), reduced likelihood of emergency department visits (−6.0 percentage points, $P = .04$), and increased outpatient visits (0.69 visits per year; $P = .04$). Screening for diabetes (6.3 percentage points; $P = .05$), glucose testing among patients with diabetes (10.7 percentage points; $P = .03$), and regular care for chronic conditions (12.0 percentage points; $P = .008$) all increased significantly after expansion. Quality of care ratings improved significantly (−7.1 percentage points with "fair/poor quality of care"; $P = .03$), as did the share of adults reporting excellent health (4.8 percentage points; $P = .04$). Comparisons of Arkansas vs Kentucky showed increased private coverage in the former (21.7 percentage points; $P < .001$), increased Medicaid in the latter (21.3 percentage points; $P < .001$), and higher diabetic glucose testing rates in Kentucky (11.6 percentage points; $P = .04$), but no other statistically significant differences.

CONCLUSIONS AND RELEVANCE In the second year of expansion, Kentucky's Medicaid program and Arkansas's private option were associated with significant increases in outpatient utilization, preventive care, and improved health care quality; reductions in emergency department use; and improved self-reported health. Aside from the type of coverage obtained, outcomes were similar for nearly all other outcomes between the 2 states using alternative approaches to expansion.

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The Medicaid expansion under the Affordable Care Act (ACA) has led to gains in coverage for millions of low-income adults in more than 30 states.[1-4] But in several states, policymakers continue to debate whether to expand Medicaid and are weighing alternative approaches, such as using private insurance, increased cost-sharing, or work requirements for beneficiaries.[5,6] In Arkansas and Kentucky, which expanded coverage in 2014, newly elected governors have proposed substantial policy changes or even reversing their expansions.[7-9] Meanwhile, Louisiana recently became the first state in the deep South to expand Medicaid.[10]

Multiple studies have assessed the early impacts of the ACA's Medicaid expansion. National data show significant increases in insurance coverage in expansion states compared with nonexpansion states, as well as improvements in access to primary care, specialty care, and prescription drugs.[1,3,11-13] Beyond coverage and access, research to date has demonstrated limited impact of the Medicaid expansion on utilization, preventive care, and health. However, coverage expansions can take several years to reach full enrollment,[14] so there is a critical need for longer-term studies.

In this report, we assess changes in access, utilization, preventive care, and self-reported health among low-income adults after 2 full years of expansion in 3 Southern states that responded differently to the ACA's optional Medicaid expansion: Texas did not expand. Kentucky expanded Medicaid with almost 90% of beneficiaries in Medicaid managed care.[15] Arkansas adopted the "private option," which used federal Medicaid funding to purchase private health insurance from the ACA marketplace for low-income adults.[16] These 3 states, each with different approaches, offer a unique opportunity to evaluate the ACA. The public health implications of expansion are perhaps greatest in Southern states, which have some of the highest poverty and uninsured rates in the country.

A previous study in these states showed that after 1 year both Kentucky's and Arkansas's expansions produced improvements in affordability and access to care in 2014 but no significant changes in utilization or health.[17] This report expands on that preliminary research using survey data from the end of 2015, documenting changes over a longer time period and offering timely evidence to inform the ongoing policy debate about the future of Medicaid.

Key Points

Question How do 2 alternative state approaches to expanding health insurance—Medicaid expansion and private insurance expansion (the "private option")—affect health care utilization and health?

Findings In this observational quasi-experimental study of nearly 9000 low-income adults in Kentucky, Arkansas, and Texas, both Medicaid and the private option were associated with significantly increased outpatient and preventive care, reduced emergency department use, and improved self-reported health, compared with nonexpansion.

Meaning Health insurance expansion under the Affordable Care Act—whether via public or private coverage—produced substantial benefits for low-income adults.

Methods

Study Design

We surveyed low-income adults in November and December of 2013, 2014, and 2015, to examine changes in health insurance, utilization, preventive care, and self-reported health. Each year, we surveyed approximately 1000 different individuals in each state; no individual was surveyed in multiple years. We then conducted a differences-in-differences analysis comparing changes before and after the ACA for the 2 expansion states (Arkansas and Kentucky) vs the nonexpansion state (Texas), and tracked how outcomes changed between the first and second year of the expansions. We then compared changes in outcomes between Kentucky and Arkansas to assess the 2 different approaches to expansion.

Survey Instrument and Outcomes

We administered a random-digit telephone survey, using landlines and cellphones, to US citizens ages 19 to 64 years with family incomes below 138% of the federal poverty level (FPL), the ACA's Medicaid eligibility threshold. The survey was available in English and Spanish. Survey questions were primarily drawn from government surveys, the Oregon Health Insurance Experiment, and other national surveys.[18-22] The overall response rate was 21% (range, 20%-24% per year). All results were weighted to demographic benchmarks from federal government survey data to produce estimates corresponding to the target population in each state; further methodological details (including state-specific response rates) are described in the eMethods in the Supplement and previous publications.[17,23]

Our study outcomes were presence and type of health insurance; having a personal physician; usual location of care; cost-related delays in obtaining care or prescription medications; difficulty making appointments for primary and specialty care; trouble paying medical bills; out-of-pocket medical spending; outpatient, emergency department (ED), and inpatient utilization; receipt of cholesterol and glucose tests; regular care for chronic conditions; self-reported quality of care; self-reported health; and a validated 2-item depression screen.[24]

Statistical Analysis

We used multivariable linear regression to analyze changes in outcomes from before expansion (2013) vs after expansion (2014 and, separately, 2015) in the study states. We specified 2 different analyses. The first compared the expansion states (Arkansas and Kentucky) with the nonexpansion state (Texas) to assess the overall impact of coverage expansion. This model used a binary variable for *Medicaid Expansion* interacted with each of the 2 postexpansion years (2014 and 2015); modeling these years separately enabled us to identify the postexpansion trend by year for each outcome.

In the second analysis, an additional interaction term between the private option and the 2014 and 2015 expansion variables was added to this model, allowing us to compare Arkansas's private option with Kentucky's traditional Medicaid expansion.

Each person was assigned a primary type of insurance coverage (see eMethods in the Supplement). Medical out-of-pocket spending was converted from 6 discrete categories into a linear variable, using the midpoint of each dollar-value category, then analyzed as the logarithm of spending. We used linear models for all outcomes for ease of interpretation.[25] Following our previous analysis, we used robust standard errors clustered at the county level, which generally produced more conservative confidence intervals in our models than state-based clustering, given the small number of state clusters.[17] Models adjusted for sex, age, marital status, family size, race/ethnicity, education, income, urban vs rural residence, annual county unemployment rate,[26] year, and state. See the Supplement for full regression equations; sample power calculations for the private option vs Medicaid expansion; and results of sensitivity analyses using logistic or Poisson models, omitting observations with missing covariates, and pooling 2014-2015 data.

We also separately examined 2 subgroups likely to experience greater barriers to care: racial/ethnic minorities and those in counties containing primary care health profession shortage areas as designated by the US government.[27]

To assess the representativeness of our survey's estimates, we compared our insurance measures for 2013 to 2014 with the US Census Bureau's American Community Survey and several access measures to the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System, for adults meeting our inclusion criteria: US citizens in the study states ages 19 to 64 years, with family incomes below 138% of the FPL. Despite some differences in sample definition between our survey and the government surveys, these analyses showed reasonable concordance (eTables 1 and 2 in the Supplement): mean absolute differences in state-level estimates ranged from 2.8 to 7.3 percentage points for insurance with high correlation across states and years (ρ = 0.80 to 0.99), and mean absolute differences of 3.0 to 11.4 percentage points for access to care measures with moderate-to-high correlation across states and years (ρ = 0.55 to 0.82). These differences are consistent with the magnitude of differences found in previous research comparing estimates of coverage and access to care across different government surveys (see eMethods in the Supplement).[22]

Data analysis was conducted between January and May 2016. The authors only had access to deidentified survey data. Human subjects review was waived by the institutional review board at the Harvard T. H. Chan School of Public Health.

Results

Sample Characteristics

Table 1 presents demographic and health characteristics by state (n = 8676). The state samples did not significantly differ in terms of income ($P = .45$), marital status ($P = .76$), and sex ($P = .71$). Respondents in Texas were slightly younger ($P = .02$), more urban ($P < .001$), and disproportionately Latino ($P < .001$) compared with respondents in Arkansas and Kentucky. Most respondents in all 3 states (64%-95%) resided in counties containing primary care shortage areas. Depending on the state, 55% to 70% of adults reported at least 1 chronic condition, with depression and hypertension the most prevalent.

Coverage Changes

The **Figure** presents unadjusted patterns of insurance coverage by state for 2013 vs 2015. Uninsured rates dropped dramatically in Arkansas (from 41.8% to 14.2%) and Kentucky (from 40.2% to 8.6%), and more modestly in Texas (from 38.5% to 31.8%). Coverage gains were largely from private insurance in Arkansas and from Medicaid in Kentucky.

Comparing Expansion to Nonexpansion

Table 2 presents differences-in-differences estimates of changes associated with Medicaid expansion (eTable 3 in the Supplement presents unadjusted state-by-state estimates). The first set of results in Table 2 compares changes in expansion states with those in nonexpansion states after the first year of expansion (2014 vs 2013), and the second set shows changes after 2 years (2015 vs 2013). Relative to Texas, Medicaid expansion was associated with a 14.0 greater percentage-point decrease in the uninsured rate in 2014 ($P < .001$) and a 22.7 greater percentage-point decrease in 2015 ($P < .001$), both compared with 2013.

In terms of access and utilization, numerous outcomes that had not changed by 2014 showed significant changes by 2015. By 2015, Medicaid expansion was associated with a significant increase in the likelihood of having a personal physician (12.1 percentage points; $P < .001$), and a decreased reliance on the ED as a usual location of care (−6.1 percentage points; $P = .003$). In 2015, expansion was associated with reductions in cost-related barriers to care (−18.2 percentage points; $P < .001$), skipping prescription medications (−11.6 percentage points; $P < .001$), and difficulty with medical bills (−14.0 percentage points; $P < .001$), as well as a 29.5% reduction in annual out-of-pocket medical spending from a baseline mean of $434 ($P = .02$).

There were also changes in utilization and health. Medicaid expansion was associated with a significantly decreased likelihood of any ED visits (−6.0 percentage points; $P = .04$), while the number of office visits increased by 0.69 per person ($P = .04$). Expansion was associated with increased likelihood of a checkup (16.1 percentage points; $P < .001$) and a glucose check (6.3 percentage points; $P = .05$) in the past year, and an increase in glucose monitoring among patients with diabetes (10.7 percentage points; $P = .03$). Compared with Texas, in Medicaid expansion the share of adults obtaining regular care for chronic conditions increased by 12.0 percentage points after expansion ($P = .008$), the proportion of adults reporting fair or poor quality of care declined (−7.1 percentage points; $P = .03$), and the proportion reporting excellent health increased (4.8 percentage points; $P = .04$). Expansion was not associated with significant changes in depression rates (−6.9 percentage points; $P = .08$).

Comparing Traditional Medicaid With the Private Option

Table 3 shows regression estimates comparing changes in 2015 vs 2013 for Arkansas vs Kentucky. Private coverage gains were

Table 1. Descriptive Statistics for the Study Sample of 8676 Low-Income Adults, by State[a]

Variable	Arkansas	Kentucky	Texas	*P* Value
Sample size, No.	2890	2898	2888	NA
Female	57	56	58	.71
Age, y				.02
19-34	41	40	46	
35-44	19	19	18	
45-54	16	17	16	
55-64	23	24	20	
Race/ethnicity				<.001
White non-Latino	66	84	36	
Latino	4	2	40	
Black non-Latino	25	11	19	
Other	5	3	5	
Education				.001
Less than high school degree	20	25	23	
High school graduate	47	43	40	
Some college/college graduate	33	32	38	
Family income, % of FPL				.45
<50	32	33	29	
50-100	36	37	37	
101-138	25	23	25	
Don't know/refused to answer	6	7	8	
Married or living with a partner	40	41	41	.76
Family size, No.	2.9	2.8	3.2	<.001
Rural	56	55	14	<.001
Lives in county designated a primary care health profession shortage area	64	73	95	<.001
Medical conditions				
Hypertension	37	38	28	<.001
Coronary artery disease	8	11	7	<.001
Stroke	5	5	4	.12
Asthma/COPD	26	30	18	<.001
Kidney disease	3	4	2	.01
Diabetes	15	17	14	.04
Depression	40	44	31	<.001
Cancer	5	6	3	.004
Substance abuse	3	5	4	.09
≥1 condition	68	70	55	<.001

Abbreviations: COPD, chronic obstructive pulmonary disease; FPL, federal poverty level; NA, not applicable.

[a] *P* values represent χ^2 test for significant differences in each variable across the 3 states. The Table reflects pooled estimates for the years 2013, 2014, and 2015. Values are given as percentages except where noted.

greater in Arkansas than Kentucky (21.7 percentage points; $P < .001$), while Medicaid gains were smaller in Arkansas than Kentucky (−21.3 percentage points; $P < .001$). Changes in glucose monitoring rates for patients with diabetes were lower in Arkansas than Kentucky (−11.6 percentage points; $P = .04$). None of the other 26 outcomes differed significantly between these 2 states.

Subgroup and Sensitivity Analyses

Subgroup analyses (eTable 4 in the Supplement) showed similar overall patterns but some differences from the full sample. In counties containing primary care shortage areas, we found significant improvements in access to care (multiple outcomes; $P < .05$), affordability (multiple outcomes; $P < .01$), and quality of care after expansion ($P = .01$), but no evidence of increased outpatient visits ($P = .92$) or decreased ED visits ($P = .36$). There was no significant change in self-reported health ($P = .12$), although there was a significant reduction in depression scores ($P = .04$).

Minorities experienced significant increases in coverage ($P = .004$), affordability (multiple outcomes $P < .05$), office visits ($P = .02$), and checkups ($P = .04$) after expansion, with lower ED visit rates ($P = .04$) but also significantly increased trouble obtaining specialist appointments ($P < .001$). Compared with Kentucky, minorities in Arkansas experienced greater reductions in the ED as a usual source of care ($P = .007$) and larger improvements in self-reported health ($P = .04$), but with significantly higher out-of-pocket costs ($P = .04$).

Sensitivity analyses showed similar results as our main models for most outcomes (eTable 5 in the Supplement). However, improvements in self-reported health were evident only for the share in "excellent health" but not other levels of health

or in a logistic model. In models that pooled the 2014-2015 data into a single postexpansion period or excluded observations with missing covariates, respondents in Arkansas reported higher out-of-pocket spending after expansion (estimates range, 21%-24%; P = .04) compared with Kentucky.

Discussion

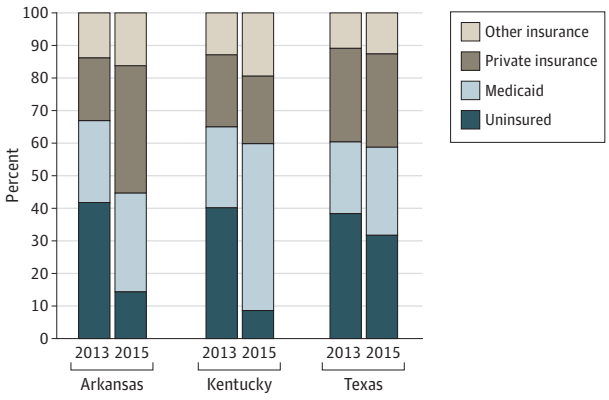
As numerous states continue debating whether and how to expand coverage to low-income adults under the ACA, our results provide important new evidence. In this report on 3 Southern states with high baseline uninsured rates, the expansions took more than 1 year to mature, suggesting that preliminary studies likely underestimate the longer-term impacts of Medicaid expansion.[13,28-31] This pattern may reflect both larger coverage increases over time and increasing familiarity with and utilization of coverage among the newly insured. By the end of 2015, we found marked increases in coverage and reduced cost-related barriers to care in the expansion states, with associated increases in preventive care, outpatient office visits, annual checkups, and chronic disease care, as well as decreased reliance on the ED (the subject of conflicting results in studies of prior coverage expansions).[32-34]

Moreover, adults in expansion states reported significant improvements in self-reported quality of care and health. Our findings of increased glucose screening rates in the general population and increased glucose monitoring among patients with diabetes are consistent with those of the Oregon Health Insurance Experiment (although that study did not show any improvement in diabetic glucose control),[35] as well as analyses of Kentucky Medicaid claims data[36] and national laboratory data.[37] Improvements in self-reported health in our study offer some of the earliest evidence that the ACA's Medicaid expansion may be producing similar benefits detected in prior insurance expansions.[19,38-40] While self-reported health has been shown to be a strong predictor of mortality,[41] it remains to be seen whether the modest changes detected in our study will lead to subsequent improvements in objective measures of population health.

Of note, we found improvements in receipt of checkups, care for chronic conditions, and quality of care even in areas with primary care shortages, suggesting that while clinician capacity is undoubtedly an important consideration,[42-44] insurance expansions can have a demonstrable positive impact even in areas with relative shortages, perhaps partially due to increased use of safety net providers.[45]

Meanwhile, half a dozen states have received federal approval to expand under the ACA using alternative program features, including the private option.[46] There is keen interest in assuring that federal flexibility does not jeopardize care for newly insured populations. We found few significant differences between Arkansas's private option and Kentucky's Medicaid expansion. Other than the type of coverage obtained (primarily private insurance in Arkansas and Medicaid in Kentucky), the only significant difference was higher glucose monitoring rates among patients with diabetes in Kentucky compared with those in Arkansas. All other outcomes related to utilization, quality of care, and self-reported health were similar for Kentucky and Arkansas. Of particular relevance to clinicians, we found no significant differences in access to primary and specialty care between private insurance and Medicaid expansions. Overall, more than 85% of low-income adults in both expansion states reported no difficulties obtaining physician appointments in 2015. Whether other state expansion models using different features than Arkansas's program would produce similar results is unclear and worthy of future study.

Figure. Unadjusted Changes in Health Insurance Coverage in the 3 Study States, 2013 vs 2015



Unadjusted survey-weighted proportions of health insurance coverage by state and year (n = 2864 for 2013, n = 3011 for 2015).

Subgroup analyses suggested that racial/ethnic minorities may be differentially affected by alternative expansion approaches. For nonwhites, the private option decreased reliance on the ED and improved self-reported health, but increased out-of-pocket spending compared with Medicaid. The latter finding likely relates to Arkansas's decision to impose more cost-sharing for higher-income private option beneficiaries than most states require in traditional Medicaid.[47] Overall, the 2 alternate expansions were associated with very similar changes for most outcomes.

Our study has several limitations. First, we used a random-digit dialing telephone survey, which produces response rates below those of federal government surveys.[22] This may introduce nonresponse bias, although weighting for observable population features (as we have done) can mitigate this bias,[48,49] and recent research demonstrates that random-digit dialing surveys "provide accurate data on most political, social and economic measures" compared with higher response-rate government surveys.[50] With regard to health care in particular, other telephone surveys with lower response rates than ours have produced estimates of ACA-related changes quite similar to subsequently released government data.[1,51,52] A smaller concern is that our survey instrument used annual family income to define the study sample, and this is an imperfect measure for ACA-related eligibility, particularly in complex family arrangements or for those with fluctuating incomes. Fortunately, our survey's estimates of coverage and several measures of access to care in 2013 to 2014 were highly correlated with government estimates, offering support for our approach.

Table 2. Changes in Coverage, Access to Care, Utilization, and Health After the ACA Medicaid Expansion[a]

Outcome	Mean in Expansion States, 2013	Net Change After Expansion (Arkansas and Kentucky vs Texas)[b]			
		2014 Net Change, vs 2013 % (95% CI)	*P* Value	2015 Net Change, vs 2013 % (95% CI)	*P* Value
Coverage					
Uninsured	41.0	−14.0 (−20.0 to −8.0)	<.001	−22.7 (−29.1 to −16.3)	<.001
Medicaid	25.0	9.8 (3.6 to 15.9)	.002	12.5 (4.8 to 20.2)	.002
Private insurance	20.7	7.4 (1.3 to 13.5)	.02	8.0 (0.0 to 16.0)	.05
Access to care and affordability					
Has a personal physician	56.9	7.7 (−0.6 to 16.0)	.07	12.1 (5.4 to 18.9)	<.001
Usual source of care[c]	80.8	4.0 (−3.2 to 11.1)	.27	10.8 (3.5 to 18.1)	.004
Cost-related delay in care	39.5	−4.2 (−10.8 to 2.5)	.22	−18.2 (−25.4 to −11.1)	<.001
Skipped medication due to cost	39.2	−9.7 (−16.2 to −3.2)	.003	−11.6 (−17.8 to −5.3)	<.001
Trouble obtaining primary care appointment	15.7	3.6 (−2.6 to 9.7)	.25	0.1 (−5.5 to 5.7)	.97
Trouble obtaining specialist appointment	14.0	2.5 (−3.1 to 8.1)	.39	1.0 (−3.5 to 5.6)	.66
ED is usual location of care[c]	9.6	−5.2 (−10.5 to 0.1)	.06	−6.1 (−10.1 to 2.2)	.003
ED visit because office visit unavailable	12.9	4.7 (0.0 to 9.4)	.05	4.7 (−1.1 to 10.6)	.11
Trouble paying medical bills	42.9	−8.8 (−14.6 to −3.0)	.003	−14.0 (−19.6 to −8.3)	<.001
Annual out-of-pocket medical spending[d]	$434	−24.2 (−49.8 to 1.4)	.06	−29.5 (−54.2 to −4.8)	.02
Utilization					
Any office visits in past year	55.5	2.5 (−3.4 to 8.4)	.41	3.0 (−3.8 to 9.7)	.38
Any ED visits in past year	21.0	−1.9 (−7.6 to 3.8)	.51	−6.0 (−11.7 to 0.3)	.04
No. office visits in past year	2.80	0.54 (−0.33 to 1.40)	.22	0.69 (0.05 to 1.33)	.04
No. ED visits in past year	1.16	−0.12 (−0.45 to 0.21)	.48	−0.09 (−0.45 to 0.27)	.62
Any hospitalization in past year	16.9	−1.5 (−6.8 to 3.7)	.57	2.1 (−3.1 to 7.3)	.43
Prevention and quality					
Checkup in past year	45.8	7.0 (−0.6 to 14.5)	.07	16.1 (9.1 to 23.0)	<.001
Cholesterol check in past year	42.0	−1.0 (−8.0 to 6.0)	.78	1.5 (−5.1 to 8.1)	.66
Cholesterol check among high-risk patients[e]	63.5	2.5 (−7.8 to 12.8)	.63	1.2 (−7.6 to 10.0)	.79
Glucose check in past year	43.0	2.3 (−5.2 to 9.8)	.54	6.3 (0.0 to 12.6)	.05
Glucose check among those with diabetes[f]	86.2	4.3 (−7.5 to 16.1)	.47	10.7 (1.2 to 20.2)	.03
Regular care for chronic condition[g]	65.7	11.6 (2.0 to 21.2)	.02	12.0 (3.1 to 21.0)	.008
Excellent quality of care	28.1	−2.7 (−10.8 to 5.5)	.52	2.2 (−5.2 to 9.5)	.56
Fair/poor quality of care	19.9	−2.5 (−8.9 to 3.9)	.45	−7.1 (−13.6 to −0.6)	.03
Health status					
Excellent self-reported health	12.2	2.4 (−2.3 to 7.1)	.32	4.8 (0.3 to 9.3)	.04
Fair/poor self-reported health	39.6	0.9 (−6.7 to 8.4)	.82	−3.2 (−11.1 to 4.7)	.43
Positive depression screen, PHQ2 score ≥2	47.5	2.0 (−5.5 to 9.4)	.60	−6.9 (−14.6 to 0.8)	.08

Abbreviation: ED, emergency department.

[a] Results show differences-in-differences estimates for expansion states (Arkansas and Kentucky) vs Texas. All analyses adjusted for sex, age, race/ethnicity, marital status, family size, education, income, urban vs rural residence, county annual unemployment rate, state, and year. The sample contained 8676 adults (minus item nonresponse for each specific outcome), except where otherwise noted.

[b] All estimates are reported as percentage-point changes for binary outcomes, other than number of office and ED visits and out-of-pocket spending.

[c] Usual source of care was grouped into 3 categories—those reporting an office-based usual source of care, those without any usual source of care, and those using the ED as the usual source of care.

[d] Out-of-pocket spending estimates show relative change (%) using log-expenditures as the outcome.

[e] Sample limited to patients reporting heart disease, stroke, diabetes, or hypertension (n = 4446).

[f] Sample limited to patients reporting a history of diabetes (n = 1768).

[g] Sample limited to patients reporting at least 1 of the following conditions: hypertension, heart attack/coronary artery disease, stroke, asthma/chronic obstructive pulmonary disease, kidney disease, diabetes, depression, cancer, and substance abuse (n = 6103).

Another limitation is that these states may not generalize to the United States. Arkansas and Kentucky have emerged as national leaders in the size of their coverage expansions[53]; in states that have been less successful at increasing coverage, this may dampen the changes detected in this study. More generally, Medicaid programs vary widely across states in terms of physician payment, covered benefits, and other features,[54] which means that our results are in some sense a case study of 2 specific expansion efforts. However, given Louisiana's recent decision to expand Medicaid, Arkansas and Kentucky can offer valuable insights into the ACA's potential impact there and in other Southern states with large uninsured populations.

Finally, our study design precludes any clear causal interpretation. While the use of a control group and multivariate

Table 3. Changes in Coverage, Access to Care, Utilization, and Health: Private Option vs Medicaid Expansion

Outcome	Net Change Between Private Option and Medicaid Expansion (Arkansas vs Kentucky, 2015 vs 2013)[a]	
	Net Change for Private Option vs Medicaid % (95% CI)	*P* Value
Coverage		
Uninsured	3.4 (−2.8 to 9.5)	.28
Medicaid	−21.3 (−29.0 to −13.6)	<.001
Private insurance	21.7 (14.2 to 29.1)	<.001
Access to care and affordability, %		
Has a personal physician	−6.8 (−14.2 to 0.7)	.08
Usual source of care[b]	6.5 (−0.9 to 13.8)	.08
Cost-related delay in care	4.7 (−3.6 to 13.0)	.26
Skipped medication due to cost	0.1 (−8.3 to 8.4)	.99
Trouble obtaining primary care appointment	−0.2 (−6.7 to 6.2)	.94
Trouble obtaining specialist appointment	1.2 (−4.1 to 6.6)	.65
ED is usual location of care[b]	−3.1 (−8.1 to 1.8)	.22
ED visit because office visit unavailable	−1.2 (−7.3 to 4.9)	.71
Trouble paying medical bills	3.9 (−4.0 to 11.9)	.33
Annual out-of-pocket medical spending[c]	22.5 (−0.3 to 45.3)	.05
Utilization, %		
Any office visits in past year	−5.0 (−14.3 to 4.2)	.28
Any ED visits in past year	−4.6 (−13.0 to 3.8)	.29
Office visits in past year, No.	0.01 (−0.80 to 0.83)	.97
ED visits in past year, No.	0.13 (−0.32 to 0.57)	.57
Any hospitalization in past year	0.8 (−5.4 to 7.0)	.80
Prevention and quality, %		
Checkup in past year	−3.0 (−11.3 to 5.4)	.49
Cholesterol check in past year	−6.5 (−13.3 to 0.3)	.06
Cholesterol check among high-risk patients[d]	−8.3 (−19.0 to 2.4)	.13
Glucose check in past year	−5.6 (−14.2 to 3.0)	.20
Glucose check among those with diabetes[e]	−11.6 (−22.9 to −0.3)	.04
Regular care for chronic condition[f]	2.7 (−5.3 to 10.8)	.50
Excellent quality of care	3.8 (−6.3 to 13.9)	.46
Fair/poor quality of care	−3.4 (−11.7 to 4.9)	.42
Health status, %		
Excellent self-reported health	0.2 (−4.5 to 4.8)	.94
Fair/poor self-reported health	1.9 (−7.5 to 11.4)	.69
Positive depression screen, PHQ2 score ≥2	0.1 (−8.8 to 8.9)	.99

Abbreviations: ED, emergency department; PHQ, Patient Health Questionnaire.

[a] All estimates are reported as percentage-point changes for binary outcomes, other than number of office and ED visits and out-of-pocket spending. Results show differences-in-differences estimates for Arkansas vs Kentucky. All analyses adjusted for sex, age, race/ethnicity, marital status, family size, education, income, urban vs rural residence, county annual unemployment rate, state, and year. The sample contained 8676 adults (minus item nonresponse for each specific outcome), except where otherwise noted. The sample includes respondents from Texas, although the coefficient of interest reports the differences between Arkansas and Kentucky; results are similar if Texas is excluded from the sample.

[b] Usual source of care was grouped into 3 categories—those reporting an office-based usual source of care, those without any usual source of care, and those using the ED as the usual source of care.

[c] Out-of-pocket spending estimates show relative change (%) using log-expenditures as the outcome.

[d] Sample limited to patients reporting heart disease, stroke, diabetes, or hypertension (n = 4446).

[e] Sample limited to patients reporting a history of diabetes (n = 1768).

[f] Sample limited to patients reporting at least one of the following conditions: hypertension, heart attack/coronary artery disease, stroke, asthma/COPD, kidney disease, diabetes, depression, cancer, and substance abuse (n = 6103).

adjustment rules out effects from secular trends and observable confounders (eg, the higher levels of urban and Latino residents in Texas, and county-level unemployment rates), unmeasured time-varying differences across the states including migration patterns or non-ACA health system changes may have biased our results. However, the consistency of our findings with previous randomized and quasi-experimental studies of insurance expansions makes alternative explanations less likely.[19,35,38,39]

Our study has several strengths. Our sequential surveys allow us to assess the changing impact of the Medicaid expansion over time. The survey's rich set of outcomes adds important texture to our understanding of the ACA. By including both a public insurance expansion and private option, our study provides important information as states debate alternative approaches. By targeting a sample of individuals most likely to gain coverage under the expansion—namely, poor adults in 2 states with the largest coverage gains under the ACA—we have greater statistical power to detect changes associated with this policy than many national analyses. Finally, by using a telephone survey with a short turnaround time, we offer timely evidence to inform policy decisions being made in these states and others.

Conclusions

We find that significant impacts of Medicaid expansion may take several years to unfold. After 2 years of coverage expansion in Kentucky and Arkansas, compared with Texas's nonexpansion, there were major improvements in access to primary care and medications, affordability of

care, utilization of preventive services, care for chronic conditions, and self-reported quality of care and health. As Kentucky and Arkansas reconsider the future of their expansions, our study (along with evidence on the financial benefits to these states of expansion)[55] provides support for staying the course. For other states still considering whether to expand, our study suggests that coverage expansion under the ACA—whether via Medicaid or private coverage—can produce substantial benefits for low-income populations.

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Study concept and design: Sommers, Blendon, Epstein.
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