

Early Coverage, Access, Utilization, and Health Effects Associated With the Affordable Care Act Medicaid Expansions

A Quasi-experimental Study

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Background: In 2014, only 26 states and the District of Columbia chose to implement the Patient Protection and Affordable Care Act (ACA) Medicaid expansions for low-income adults.

Objective: To evaluate whether the state Medicaid expansions were associated with changes in insurance coverage, access to and utilization of health care, and self-reported health.

Design: Comparison of outcomes before and after the expansions in states that did and did not expand Medicaid.

Setting: United States.

Participants: Citizens aged 19 to 64 years with family incomes below 138% of the federal poverty level in the 2010 to 2014 National Health Interview Surveys.

Measurements: Health insurance coverage (private, Medicaid, or none); improvements in coverage over the previous year; visits to physicians in general practice and specialists; hospitalizations and emergency department visits; skipped or delayed medical care; usual source of care; diagnoses of diabetes, high cholesterol, and hypertension; self-reported health; and depression.

Results: In the second half of 2014, adults in expansion states experienced increased health insurance (7.4 percentage points [95% CI, 3.4 to 11.3 percentage points]) and Medicaid (10.5 per-

centage points [CI, 6.5 to 14.5 percentage points]) coverage and better coverage than 1 year before (7.1 percentage points [CI, 2.7 to 11.5 percentage points]) compared with adults in nonexpansion states. Medicaid expansions were associated with increased visits to physicians in general practice (6.6 percentage points [CI, 1.3 to 12.0 percentage points]), overnight hospital stays (2.4 percentage points [CI, 0.7 to 4.2 percentage points]), and rates of diagnosis of diabetes (5.2 percentage points [CI, 2.4 to 8.1 percentage points]) and high cholesterol (5.7 percentage points [CI, 2.0 to 9.4 percentage points]). Changes in other outcomes were not statistically significant.

Limitation: Observational study may be susceptible to unmeasured confounders; reliance on self-reported data; limited post-ACA time frame provided information on short-term changes only.

Conclusion: The ACA Medicaid expansions were associated with higher rates of insurance coverage, improved quality of coverage, increased utilization of some types of health care, and higher rates of diagnosis of chronic health conditions for low-income adults.

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A key component of the Patient Protection and Affordable Care Act (ACA) was to expand Medicaid eligibility to adults earning up to 138% of the federal poverty level (FPL). Although this provision was originally intended to be enacted in all states, a U.S. Supreme Court decision gave states the option not to adopt it. Twenty-four states decided to forgo the expansion in 2014, affecting 6.7 million uninsured low-income adults who would otherwise have gained eligibility (1). Although a few states have since chosen to expand Medicaid, 19 have not done so at this time (2).

Little is known about the effect of the ACA Medicaid expansions on access to care, utilization, and health. This represents a critical gap in knowledge as policymakers continue to debate whether to implement this policy. Early studies have indicated an increase in insurance coverage among low-income adults in states that expanded Medicaid compared with those that did not (3–6). Other investigators have analyzed previous state Medicaid expansions for low-income adults and found that these expansions were associated with lower mortality, greater coverage and access to care, higher utilization rates, and better self-reported health (7–10). A recent study found that low-income adults in states that expanded Medicaid under the ACA

were less likely than those in nonexpansion states to report having no personal physician or no easy access to medicine (6). However, that study did not include information on several important outcomes, such as the use of health services and the diagnosis of chronic conditions. To date, there has been no direct analysis of the effect of the ACA Medicaid expansions on health care utilization and only limited analysis of the effect on access to care and health among persons gaining coverage.

METHODS

Study Design

We used a quasi-experimental difference-in-differences design that compared changes in outcomes for residents of expansion and nonexpansion states be-

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Context

The effect on health care and patient outcomes of the 2014 state Medicaid expansions for low-income adults is of interest to politicians, policymakers, insurers, and the public.

Contribution

Data from the National Health Interview Survey for 2010 to 2014 show that states implementing the expansions saw improvements in several outcomes, including insurance coverage and quality, health care utilization, and rates of diagnosis of key conditions. There was no improvement in self-reported health status among enrollees.

Implication

State Medicaid expansions seem to be achieving the broad goals of the Patient Protection and Affordable Care Act. Assessing the effects of such expansions over time, including perceptions of health status among participants, will be important.

fore and after the 2014 ACA Medicaid expansions. Our study period included the 4 years before (2010 to 2013) and the first year after (2014) the expansions. The difference-in-differences method adjusted for time-invariant differences in characteristics across the expansion and nonexpansion states as well as secular changes in outcomes over time. We defined expansion states as those implementing the ACA expansion by the end of 2014, with all other states serving as controls. The Medicaid expansions were effective on 1 Jan-

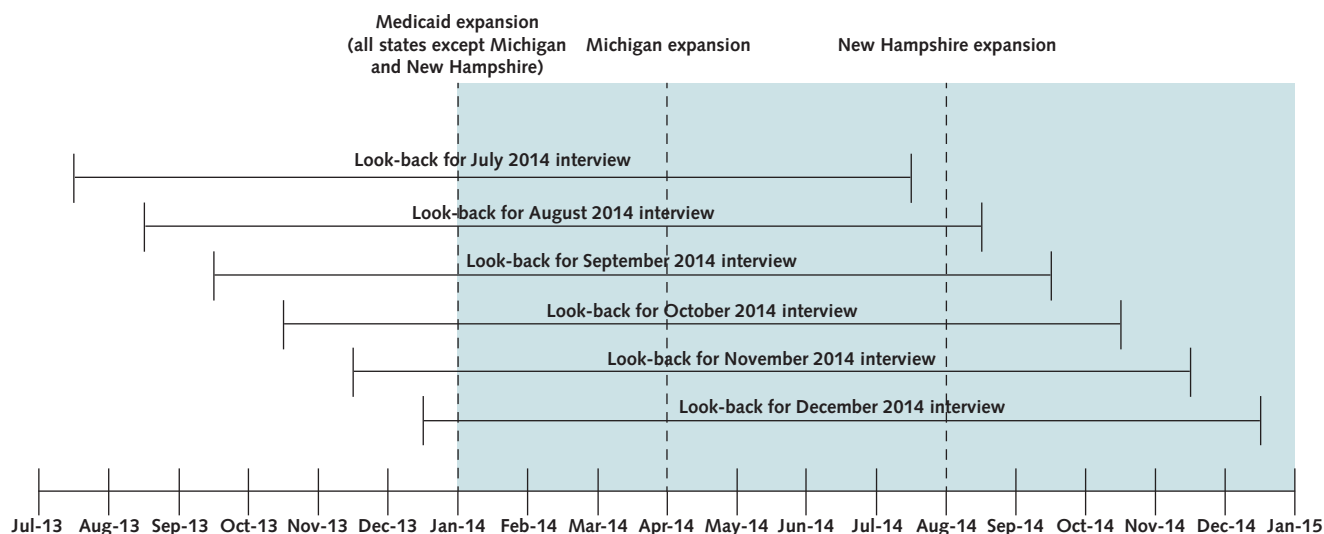
uary 2014 in all states except Michigan and New Hampshire. We excluded 5 states that already provided Medicaid or similar coverage to low-income adults during 2010 to 2013 (see Section 1 of the **Supplement**, available at www.annals.org).

Data

This study used data for 2010 to 2014 from the National Health Interview Survey (NHIS), a nationally representative annual survey conducted by the National Center for Health Statistics (NCHS). In this cross-sectional survey, respondents are interviewed throughout the survey year. One advantage of this survey is its high response rate (>70%) (11). The study sample included nonelderly U.S. citizens (aged 19 to 64 years) in families with incomes less than 138% of the FPL, with information on race, ethnicity, age, sex, marital status, and educational attainment. Approximately 1% of respondents were excluded from the sample because of missing information on marital status or educational attainment; for those who were missing information on family income (9.5%), imputed values from multiple imputation files provided by NCHS were used (12). We excluded noncitizens from the analysis because not all of these persons are eligible for Medicaid (13). Our study used restricted-access state identifiers in the NHIS and was performed in a Census Research Data Center. The study was deemed exempt from review by the investigators' designated institutional review boards.

We defined the postexpansion period to include respondent interviews in the second half of 2014 rather than all of 2014 because several of the outcome measures asked about respondent experiences during the previous 12 months. **Figure 1** illustrates the timing of this 12-month look-back period for respondents inter-

Figure 1. 12-mo look-back for participant response relative to timing of 2014 ACA state Medicaid expansions, by National Health Interview Survey interview month.



ACA = Patient Protection and Affordable Care Act.

viewed in the second half of 2014 relative to the timing of the state ACA Medicaid expansions (green shading). For almost all respondents, the majority of the 12-month look-back period occurred during the period of expanded Medicaid eligibility. On average, respondents in expansion states in the second half of 2014 had received 8.7 months of exposure to the ACA Medicaid expansions at the time of the interview.

Outcome Measures

All outcomes used in the analysis were based on self-reported information in the NHIS. The first set of outcomes was related to insurance coverage and health care utilization. Three binary coverage variables indicated no health insurance coverage (defined as coverage through Medicare, Medicaid, a private insurer, the military, or other government programs [excluding the Indian Health Service]), Medicaid coverage, and private insurance coverage at the time of the interview. In addition, we examined whether respondents reported that their health insurance or health care coverage was better than it had been 1 year before; this measure was not available for the 2010 survey year. The utilization measures were whether the respondent saw or spoke to a physician in general practice, family medicine, or internal medicine; saw or spoke to a medical specialist (excluding obstetrician-gynecologists, psychiatrists, and ophthalmologists); was hospitalized overnight (excluding in the emergency department [ED]); or visited a hospital ED during the previous 12 months.

We next considered outcomes related to access to care, diagnoses of health conditions, and self-reported health. To measure access, we used 2 binary variables that indicated whether the respondent did not obtain necessary medical care because of cost or delayed care because of worry about cost within the previous 12 months. We also considered whether the respondent had a usual place of care for when they were sick or needed advice about their health and whether they reported not having a usual place of care because of the expense or a lack of insurance; the latter measure was not available for the 2010 survey year. Following prior work (10), we investigated whether the respondent reported ever having been diagnosed with diabetes, hypertension, or high cholesterol by a physician or health professional. The diagnosis of high cholesterol was available only for the 2012 and 2014 survey years. The health outcomes were whether the respondent reported their health to be "very good" or "excellent," whether their health was better than it had been 1 year before, and whether they mentioned depression as a health problem. Some outcomes were available for all members of surveyed households, whereas others were available only for one sampled member of the household (Section 2 and Table 1 of the Supplement).

Statistical Analysis

Baseline sample characteristics and unadjusted means for each outcome for 2010 to 2013 (preexpansion period) and the second half of 2014 (postexpansion period) were estimated for expansion and nonex-

pansion states, with survey design variables provided by NCHS (11) used to account for the complex, multi-stage sampling design of the NHIS. In addition, we used an *F* test to evaluate differences in baseline characteristics for the 2 groups of states and unadjusted difference-in-differences for each outcome measure.

We estimated a multivariate regression model to compare changes in outcomes for expansion and non-expansion states. Our independent variable of interest was the interaction between a variable indicating that the state adopted the ACA Medicaid expansion and a variable indicating that the respondent was interviewed in the second half of 2014. The estimated coefficient on this term provided the average difference in outcomes in expansion and nonexpansion states in the second half of 2014 versus before the implementation of the ACA Medicaid expansions. Observations from the first half of 2014 remained in the sample and were indicated with a separate binary variable that was also interacted with the indicator for the Medicaid expansions. Our estimates were adjusted for race and ethnicity, marital status, number of children and adults in the family, educational attainment, and age, as well as state, half-year, and interview quarter fixed effects. The regression models used NHIS sampling weights, and we estimated Huber-White robust SEs clustered at the state level to account for within-state correlation of the error terms and the state-level nature of the policy change (14). Additional details on the regression model are provided in Section 3 of the Supplement.

We used linear probability models rather than nonlinear models to conduct this analysis. The primary drawback of using a linear model with binary outcome variables is that it can produce predicted probabilities that lie outside the [0,1] interval (15). However, in our case, the true probabilities were in a range where linear approximation generally performs well (16) and few predicted values fell outside the [0,1] interval (Table 2 of the Supplement). In addition, the time required to run nonlinear models was prohibitive, and the results estimated from the logit model and the linear model were comparable (Tables 3 and 4 of the Supplement). We computed robust SEs to correct for heteroskedastic variance present under the linear model. Additional discussion is provided in Section 4 of the Supplement.

All analyses were conducted with Stata/IC, version 14.0 (StataCorp), and used procedures for performing multiple imputation analyses with complex survey data (12, 17). Additional information on the Stata commands used in the analysis is provided in Section 5 of the Supplement.

We conducted several analyses to evaluate the assumptions of our model and assess the sensitivity of our results to alternative model specifications. We tested for preexisting differential trends across expansion and nonexpansion states and assessed the sensitivity of our results to the inclusion of group time trends and the state unemployment rate in the study period. We also evaluated the sensitivity of our results to alternative sample definitions that included states that expanded Medicaid before implementation of the ACA,

Table 1. Baseline Characteristics of Sample, by State Medicaid Expansion Status*

Characteristic	Expansion States (n = 19 140†)	Nonexpansion States (n = 21 287†)	P Value
Male, %	45.5	43.6	0.010
Race, %			0.046
White	73.5	67.7	
Black	18.7	28.6	
Other	7.7	3.7	
Hispanic, %	18.4	12.9	0.50
Mean age (SD), y	37.4 (13.7)	37.7 (13.8)	0.42
Family composition			
Married, %	28.5	29.5	0.51
Mean number of children (SD)	1.1 (1.4)	1.1 (1.4)	0.95
Mean number of adults (SD)	2.1 (1.1)	2.0 (1.1)	0.57
Education, %			0.139
Less than high school diploma	21.5	22.6	
High school diploma or equivalent	32.7	36.8	
Some college education	35.4	32.4	
College degree or greater	9.9	7.9	

* Weighted baseline characteristics were estimated using pooled data from the 2010 to 2013 National Health Interview Surveys. The estimation sample was defined as U.S. citizens aged 19 to 64 y with family incomes less than 138% of the federal poverty level. The latter characteristic was imputed for respondents with missing values for family income by using multiple imputation files provided by the National Center for Health Statistics. Additional details on the multiple imputation procedures used in the analysis are provided in the text and the **Supplement**.

† Number of observations.

excluded late implementers of the expansion in 2014, included noncitizens, included only adults with incomes less than 100% of the FPL, and included only adults older than 25 years. We examined how the Medicaid expansions affected trends over time in our outcome variables by using an interrupted time-series design and estimated a triple-difference model that used respondents with high incomes as an additional comparison group. Finally, we examined the sensitivity of our results to an alternative method of conducting inference (18). Details of these analyses are provided in Section 6 of the **Supplement**.

Role of the Funding Source

This study received no funding.

RESULTS

Main Analysis

Table 1 presents baseline descriptive statistics for survey respondents in the expansion and nonexpansion states. Low-income adults in expansion states were less likely to be black (18.7% vs. 28.6%) and more likely to be white (73.5% vs. 67.7%) or of another race (7.7% vs. 3.7%). Figure 2 plots the unadjusted insurance coverage outcomes for adults in expansion and nonexpansion states from 2010 to 2014. For each state group, the panels show the percentage of low-income adults who were uninsured, were enrolled in Medicaid, were enrolled in private insurance, and reported that their insurance coverage had improved over the previous year. All 4 variables had similar trends in the nonexpansion and expansion states before 2014; however, the series diverged starting in 2014, with larger reductions in the uninsurance rate, larger increases in Medicaid coverage, and improvements in insurance in the states that adopted the expansions. Figure 3 presents trends in physician visits, specialist visits, hospitalizations, ED visits, access measures, and diabetes diagnoses across

the expansion and nonexpansion states. Additional outcomes are summarized in Section 7 and Figure 1 of the **Supplement**.

The adjusted difference-in-differences estimates for outcomes related to coverage and utilization are presented in Table 2. Estimates for changes during the first half of 2014 relative to the pre-ACA period are shown in Tables 3 and 4 of the **Supplement**. Medicaid coverage increased significantly after the ACA Medicaid expansions in the expansion states versus the nonexpansion states (10.5 percentage points [95% CI, 6.5 to 14.5 percentage points]), whereas the percentage of respondents reporting no insurance coverage decreased (−7.4 percentage points [CI, −11.3 to −3.4 percentage points]). Respondents in expansion states were also more likely to report that their health insurance coverage had improved over the past year (7.1 percentage points [CI, 2.7 to 11.5 percentage points]). Visits with a general physician (6.6 percentage points [CI, 1.3 to 12.0 percentage points]) and overnight hospital stays (2.4 percentage points [CI, 0.7 to 4.2 percentage points]) in the previous 12 months also increased significantly in the expansion states versus the nonexpansion states. No significant changes in private health insurance coverage (−3.7 percentage points [CI, −7.6 to 0.2 percentage points]) or other utilization measures were associated with the expansions.

Table 3 presents outcomes related to access to care, diagnoses of chronic conditions, and health. There were no significant changes in measures related to access, health status, or mental health in the expansion states compared with the nonexpansion states. There were significant increases in respondents reporting diagnoses of diabetes (5.2 percentage points [CI, 2.4 to 8.1 percentage points]) and high cholesterol (5.7 percentage points [CI, 2.0 to 9.4 percentage points]) associated with the expansions but no significant change in hypertension diagnoses.

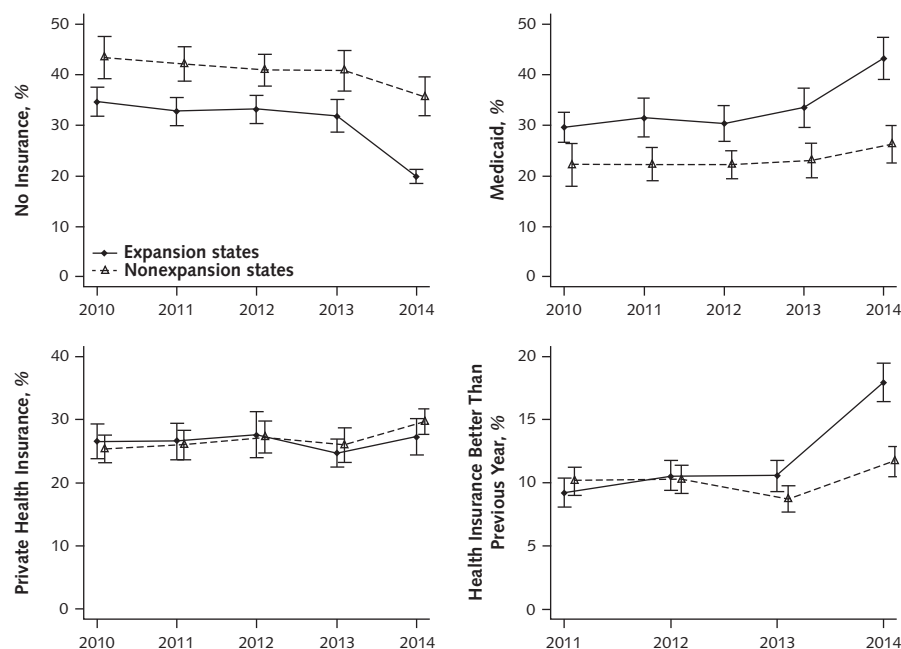
Sensitivity Analysis

Alternative models and sample definitions resulted in findings similar to those presented in the main analysis (Tables 3 and 4 of the Supplement). When a percentile-*t* cluster bootstrap procedure was used to conduct hypothesis testing, all results remained statistically significant (Table 5 of the Supplement). Tests for differences in trends in outcomes for the 2 state groups before the Medicaid expansions did not reveal significant differences for most outcome variables. However, for reports of no usual source of care because of cost, hypertension diagnosis, and health improvements during the previous year, the null hypothesis that pre-ACA trends were identical across the expansion and nonexpansion states was rejected (Table 6 of the Supplement). Estimating additional models that controlled for different trends in outcomes in expansion and nonexpansion states did not affect our findings on any outcomes; the same was true when we estimated the triple-difference model (Tables 3 and 4 of the Supplement). Finally, we modeled the effect of the ACA expansions by using an interrupted time-series approach to examine changes in trends in addition to changes in levels for the outcome variables (Section 8 of the Supplement). We found that the expansions were associated with an increased positive trend in Medicaid coverage but no change in trends for other variables (Tables 7 and 8 of the Supplement). We were unable to perform these tests for diagnoses of high cholesterol because we observed only one data point before and after the expansions.

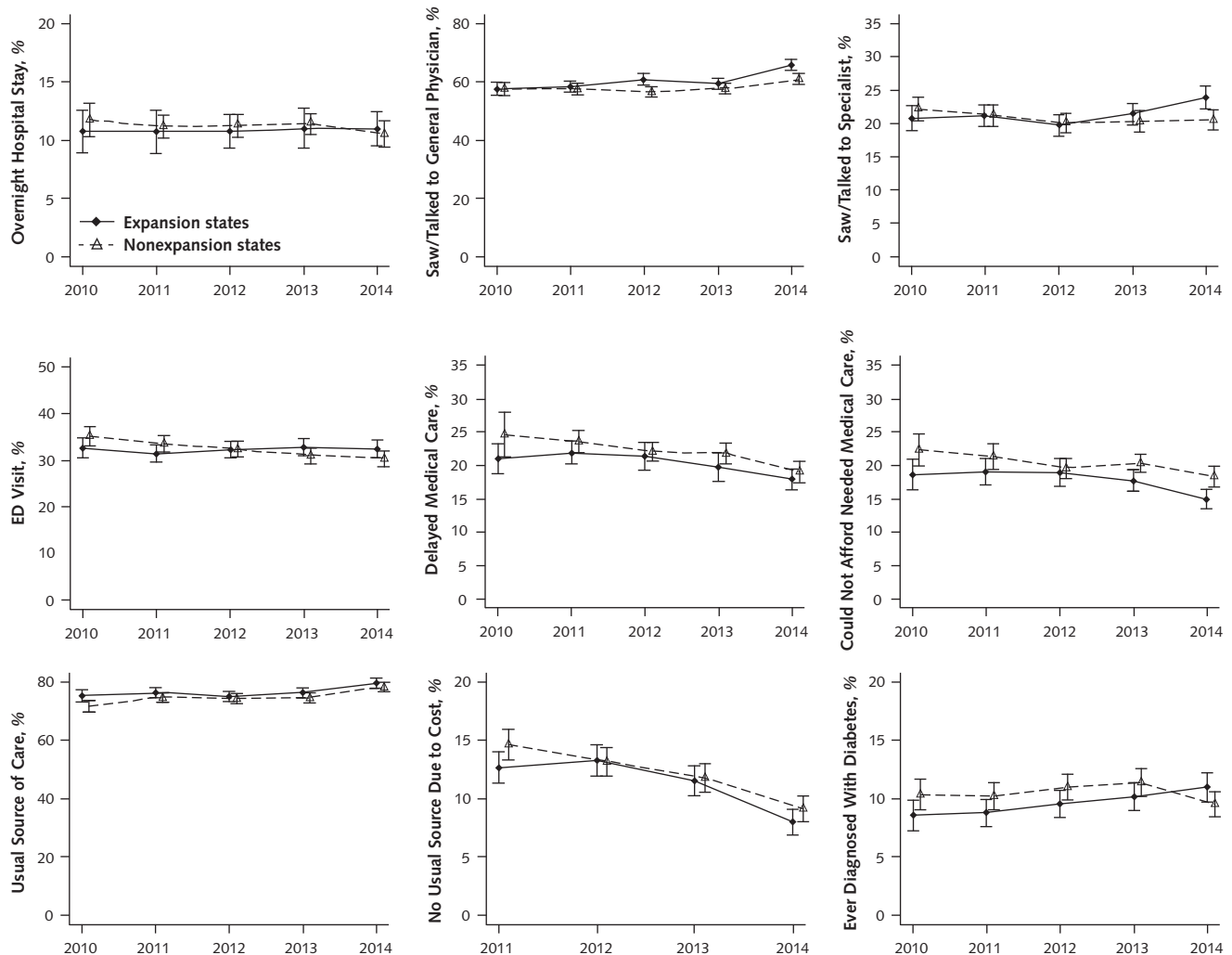
DISCUSSION

Our study explored the consequences of the ACA Medicaid expansions by comparing changes in health insurance coverage, health care utilization, access to care, and self-reported health among low-income nonelderly adults in states that did and did not implement the expansions in 2014. This is the first study to rely on nationally representative federal survey data to evaluate the effect of the ACA Medicaid expansions. In states that expanded Medicaid, we found that insurance coverage increased by 7.4 percentage points and Medicaid coverage increased by 10.5 percentage points compared with nonexpansion states. This finding is consistent with early estimates from the NHIS, but our estimates are greater in magnitude than those using data from Gallup, the American Community Survey, and the Urban Institute (3–6, 19). Our estimates of the increase in Medicaid enrollment are smaller than those implied by state-level data provided by the Centers for Medicare & Medicaid Services on the total number of enrollees (20). Overall, our estimates are within the range of others reported in the literature. We also found new evidence that the Medicaid expansions were associated with a large and significant increase in the probability that a person would report that their health care coverage had improved compared with the previous year. We did not find evidence of a significant change in private health insurance coverage associated with the expansions under our primary model but did

Figure 2. Unadjusted trends in coverage outcomes, by ACA Medicaid expansion status.



The figure is based on calculations using data from the National Health Interview Survey for 2010 to 2014 and presents unadjusted weighted means in expansion and nonexpansion states by survey year. The error bars represent 95% CIs. Data from nonexpansion states are shifted slightly to the right to prevent overlap of confidence bounds. Note the differences in scale on the y-axes across outcomes. ACA = Patient Protection and Affordable Care Act.

Figure 3. Unadjusted trends in selected utilization, access, and health outcomes, by ACA Medicaid expansion status.

The figure is based on calculations using data from the National Health Interview Survey for 2010 to 2014 and presents unadjusted weighted means in expansion and nonexpansion states by survey year. The error bars represent 95% CIs. Data from nonexpansion states are shifted slightly to the right to prevent overlap of confidence bounds. Note the differences in scale on the y-axes across outcomes. ACA = Patient Protection and Affordable Care Act; ED = emergency department.

detect a significant decrease in certain specifications reported in Section 6 of the **Supplement**.

This study provides the first evidence of increased utilization of health services among low-income adults in states that expanded coverage. We observed significant increases in the proportion of adults who reported an overnight hospital stay or a visit to a general physician in the previous 12 months in expansion states. Under the assumption that the observed 6.6-percentage point increase in reported physician visits and the 2.4-percentage point increase in hospital stays associated with the expansions are entirely attributable to the 10.5% of the population who gained Medicaid coverage, our estimates imply that Medicaid enrollment increased the likelihood of a physician visit by 62.9 percentage points and the likelihood of a hospital stay by 22.9 percentage points for each newly enrolled beneficiary over a 12-month period. In contrast, the Or-

egon Health Insurance Experiment (OHIE) found that Medicaid increased outpatient visits by 21.2 percentage points over a 6-month period and hospitalizations by 2.1 percentage points over 12 months (8). We did not find evidence of a significant change in self-reported ED visits associated with the expansions in our main analysis. This contrasts with the findings of the OHIE, which found that Medicaid increased ED visits in an analysis that used administrative data (9), but it is consistent with early results from the OHIE that relied on self-reported ED visits (8). We did estimate a significant increase in ED visits when we restricted the sample to adults aged 26 years or older who did not benefit from changes in rules on dependent coverage during this period (Table 3 of the **Supplement**).

We also provide new evidence of a significant increase in rates of diagnosis of chronic health conditions among low-income adults under the Medicaid expan-

sions. We observed increases in respondent reports of ever being diagnosed with diabetes and high cholesterol associated with the expansions, although we found no significant change in the diagnosis of hypertension. In contrast, the OHIE found no change in rates of diagnoses of hypertension and high cholesterol but a substantial increase in diabetes diagnoses (10). In addition, an early study of diabetes diagnoses after the ACA Medicaid expansions that was based on laboratory data found evidence of an increase in the number of Medicaid enrollees with newly identified diabetes in expansion states compared with nonexpansion states (21). The increased detection of chronic health conditions under the Medicaid expansions could have important implications for both population health and national health care spending if it leads to improved management and control of these conditions (22).

We did not observe consistent evidence of improvements in access to health care or health status in expansion states. We also did not find significant changes in measures of access in our main analysis, but we did find significant effects under certain specifications reported in **Tables 3 and 4 of the Supplement**. Two questions related to access to care asked respondents about their experience during the previous 12 months, which included some months before the Medicaid expansion for most respondents; this may have attenuated our results, especially if respondents did not sign up for Medicaid as soon as they became eligible.

In addition, we found no evidence of improvements in self-reported health among low-income adults in expansion states. This contrasts with studies of pre-

ACA state Medicaid expansions for adults but is consistent with a recent evaluation of the ACA Medicaid expansions that used Gallup data (6, 7, 10). One potential explanation is that, as a result of the expansions, increased contact with health care professionals and respondents' improved knowledge about their health conditions may negatively affect their perceived health in the short term (23, 24). Finally, although the OHIE found improved mental health and decreased positive screening results for depression, we did not find evidence of a change in reports of depression as a health problem associated with the Medicaid expansions.

Our study has several limitations. First, because the policy decision to expand Medicaid is not assigned randomly, we cannot definitively exclude the possibility that a contemporaneous but unrelated change in either group of states confounded the results. Second, our study does not account for differences in the design and implementation of the Medicaid expansions across states, as allowed under the federal Section 1115 waiver process. In our analysis, we estimated the average change in outcomes among all low-income adults residing in states adopting Medicaid expansions but expected that the effects of the expansions would vary across states depending on the nature of the Medicaid expansions, health care systems, and population in the state. Third, survey data outcomes are based on respondents' recall of their use of health services and may be less accurate than administrative data. Fourth, these data only contain information on the first year after the Medicaid expansions; if changes in health and utilization take longer than 1 year to materialize, it may

Table 2. Changes in Health Insurance Coverage and Health Care Utilization in States With Medicaid Expansions*

Outcome	Expansion States		Nonexpansion States		Unadjusted Difference-in-Differences		Adjusted Difference-in-Differences	
	Preexpansion	Postexpansion	Preexpansion	Postexpansion	Estimate (95% CI)	P Value	Estimate (95% CI)	P Value
Health insurance, %								
No insurance coverage	33.1	18.2	41.7	33.9	-7.1 (-11.1 to -3.0)	0.001	-7.4 (-11.3 to -3.4)	<0.001
Medicaid coverage	31.2	44.8	22.4	25.5	10.4 (6.3 to 14.5)	<0.001	10.5 (6.5 to 14.5)	<0.001
Private health insurance	26.4	28.0	26.2	32.0	-4.2 (-8.7 to 0.2)	0.061	-3.7 (-7.6 to 0.2)	0.066
Health insurance or health care coverage better than 1 y before	10.0	19.8	9.6	12.5	6.9 (2.5 to 11.2)	0.003	7.1 (2.7 to 11.5)	<0.001
Health care utilization in previous 12 mo, %								
Saw or talked to general physician	58.0	67.9	56.2	58.2	7.9 (2.3 to 13.5)	0.007	6.6 (1.3 to 12.0)	0.016
Saw or talked to medical specialist	20.0	23.8	20.0	21.0	2.8 (-2.3 to 7.8)	0.28	2.0 (-2.7 to 6.6)	0.40
Overnight hospital stay	10.8	11.3	11.4	9.2	2.7 (0.9 to 4.4)	0.004	2.4 (0.7 to 4.2)	0.007
ED visit	31.8	32.1	32.2	29.6	2.9 (-2.2 to 8.0)	0.26	2.5 (-2.6 to 7.6)	0.33

ED = emergency department.

* The preexpansion period was defined as 2010 to 2013, and the postexpansion period was defined as the second half of 2014. All preexpansion and postexpansion means and difference-in-differences estimates used survey weights. Adjusted difference-in-differences estimates were adjusted for race and ethnicity; age; marital status; number of children and adults in the family; educational attainment; and state, half-year, and interview quarter fixed effects. All analyses were conducted using multiple imputation methods. Standard errors are robust to heteroskedasticity and clustered by state.

Table 3. Changes in Access, Health, and Diagnosed Health Conditions in States With Medicaid Expansions*

Outcome	Expansion States		Nonexpansion States		Unadjusted Difference-in-Differences		Adjusted Difference-in-Differences	
	Preexpansion	Postexpansion	Preexpansion	Postexpansion	Estimate (95% CI)	P Value	Estimate (95% CI)	P Value
Access to health services, %								
Delayed medical care in previous 12 mo because of worry about cost	21.0	18.4	23.0	19.8	0.6 (−2.9 to 4.0)	0.75	0.2 (−2.9 to 3.4)	0.87
Did not receive necessary medical care in previous 12 mo because could not afford it	18.6	14.7	20.9	19.0	−2.1 (−5.2 to 1.1)	0.19	−2.3 (−5.2 to 0.5)	0.107
Had usual source of care	74.6	81.6	72.0	76.7	2.4 (−2.5 to 7.3)	0.33	1.7 (−2.8 to 6.2)	0.45
No usual source of care because of cost	13.3	6.6	14.4	12.1	−4.4 (−8.8 to 0.0)	0.051	−4.3 (−8.6 to 0.0)	0.052
Health condition diagnoses, %								
Ever diagnosed with diabetes	8.3	12.8	9.6	8.1	6.0 (2.5 to 9.5)	0.001	5.2 (2.4 to 8.1)	0.001
Ever diagnosed with hypertension	25.4	29.1	28.5	29.5	2.7 (−2.4 to 7.9)	0.29	1.7 (−2.3 to 5.8)	0.39
Ever diagnosed with high cholesterol	17.9	22.5	20.0	18.2	6.3 (1.5 to 11.2)	0.012	5.7 (2.0 to 9.4)	0.003
Health status and mental health, %								
Excellent or very good health	47.0	46.0	45.6	47.8	−3.2 (−8.5 to 2.0)	0.22	−1.7 (−6.3 to 2.9)	0.46
Health better than 12 mo before	19.8	19.8	17.5	16.0	1.6 (−2.1 to 5.2)	0.39	2.0 (−1.6 to 5.6)	0.27
Depression mentioned as health problem	7.2	5.3	6.8	4.5	0.4 (−2.1 to 2.9)	0.74	0.2 (−2.2 to 2.5)	0.88

* The preexpansion period was defined as 2010 to 2013, and the postexpansion period was defined as the second half of 2014. All preexpansion and postexpansion means and difference-in-differences estimates used survey weights. Adjusted difference-in-differences estimates were adjusted for race and ethnicity; age; marital status; number of children and adults in the family; educational attainment; and state, half-year, and interview quarter fixed effects. All analyses were conducted using multiple imputation methods. Standard errors are robust to heteroskedasticity and clustered by state.

be too soon to observe the full effect of the policy. Fifth, examining multiple outcomes increases the probability that some significant estimates will be found by chance. Finally, self-reported health is subjective and may not correspond to changes in clinical measures of health.

Despite these limitations, our study provides new evidence that the ACA Medicaid expansions increased insurance coverage and health care utilization among low-income adults, in addition to increasing rates of diagnosis of diabetes and high cholesterol. By taking advantage of a rich federal survey, we were able to examine an array of outcomes that have yet to be evaluated in the context of the ACA. Fully understanding the experiences of low-income residents in the states that have already expanded coverage is a crucial input into the ongoing debate surrounding these expansions.

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