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ACA Medicaid Expansion Associated With Increased Medicaid Participation and Improved Health Among Near-Elderly: Evidence From the Health and Retirement Study

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Abstract

The Affordable Care Act (ACA) dramatically expanded health insurance, but questions remain regarding its effects on health. We focus on older adults for whom health insurance has greater potential to improve health and well-being because of their greater health care needs relative to younger adults. We further focus on low-income adults who were the target of the Medicaid expansion. We believe our study provides the first evidence of the health-related effects of ACA Medicaid expansion using the Health and Retirement Study (HRS). Using geo-coded data from 2010 to 2016, we estimate difference-in-differences models, comparing changes in outcomes before and after the Medicaid expansion in treatment and control states among a sample of over 3,000 unique adults aged 50 to 64 with income below 100% of the federal poverty level. The HRS allows us to examine morbidity outcomes not available in administrative data, providing evidence of the mechanisms underlying emerging evidence of mortality reductions due to expanded insurance coverage among the near-elderly. We find that the Medicaid expansion was associated with a 15 percentage point increase in Medicaid coverage which was largely offset by declines in other types of insurance. We find improvements in several measures of health including a 12% reduction in metabolic syndrome; a 32% reduction in complications from metabolic syndrome; an 18% reduction in the likelihood of gross motor skills difficulties; and a 34% reduction in compromised activities of daily living (ADLs). Our results thus suggest that the Medicaid expansion led to improved physical health for low-income, older adults.

Keywords

Patient Protection and Affordable Care Act, Medicaid, insurance coverage, health status, crowd-out, near-elderly adults, difference-in-differences

What do we already know about this topic?
Evidence on how the ACA Medicaid expansion affected health has been mixed, though recent work has shown improvements in mortality for the near-elderly.

How does your research contribute to the field?
By examining health outcomes not available in administrative data, we provide the first evidence of improved morbidity that not only supports the existence of mortality benefits among this group but also indicates that the health benefits of expanded coverage extend beyond mortality reduction to include improvements in quality of life.

What are your research's implications toward theory, practice, or policy?
Even without increases in overall coverage rates, crowd-out by Medicaid can improve health among low-income adults likely due to Medicaid's lower cost-sharing.

Introduction

A major objective of the 2010 Affordable Care Act (ACA) was to increase health insurance coverage among low-income adults by expanding Medicaid. However, a 2012 U.S. Supreme Court ruling allowed states to maintain federal funding for their pre-ACA-covered populations even if they did not expand; in response, many states chose not to comply. The resulting policy variation across states has generated a large literature examining the impact of the Medicaid expansion on

several outcomes. Literature reviews conclude that the expansion led to significant increases in coverage and access to care for low-income individuals in expansion states.[1,2]

The evidence on the effects of the Medicaid expansion on health, however, is less clear. While some studies document improvements in self-reported health,[3-8] cardiac health,[9] and survival from end-stage renal disease,[10] others find no significant improvements.[11-15] These studies generally focus on all non-elderly adults ages 18 to 64, sometimes limited to those with low levels of income or formal education.

In this article, we focus on near-elderly adults aged 50 to 64—who are, on average, in worse health and have greater health care needs than younger adults.[16-21] Health insurance, especially generous coverage with low out-of-pocket (OOP) costs, may facilitate access to effective medical care and correspondingly improve health more among this group than among a younger population. This is consistent with recent evidence showing that new coverage or more generous coverage leads to reduced mortality among near-elderly adults. Studies using the natural experiment created by the ACA Medicaid expansion show that the expansion led to lower cardiovascular mortality among all adults aged 45 to 64[9] and a decline in mortality among low-income adults who were aged 55 to 64 in 2014.[22] Evidence from a randomized study shows that receiving an informational letter on penalties associated with not having insurance leads to increased coverage (for all ages) and lower mortality for those aged 45-64.[23] By examining morbidity outcomes not available in administrative data, our study is the first to investigate the mechanisms underlying this emerging evidence of mortality reductions among the near-elderly.

We use newly released 2010 to 2016 Health and Retirement Study (HRS) data to understand how the ACA Medicaid expansion affects insurance coverage among the low-income near-elderly and the implications for health status. The recent release of the state geo-coded 2016 HRS (Wave 13) provides an important new source of evidence on the effects of the ACA Medicaid expansion. With the 2010–2016 HRS, we are able to examine these questions using information on over 3000 unique low-income, near-elderly individuals.

Our article makes 2 key contributions. First, although evidence of the effect of the ACA Medicaid expansion on health is mixed, we expect health improvements to be more pronounced among the near-elderly who are in worse health and are likely to benefit more from effective medical care than the general population. Thus, we provide some of the first evidence of the effect of the ACA Medicaid expansion on morbidity among a group shown to experience reduced mortality.[9,22,23] We also provide what we believe to be the first evidence of the health-related effects of the ACA Medicaid expansion using data from the HRS.

Second, we provide suggestive evidence of possible mechanisms underlying these morbidity improvements. Although the estimates are fragile and fail to achieve statistical significance at conventional statistical standards, we observe a pattern consistent with a reduction in OOP costs and an increase in some measures of health care utilization.

Background and Related Literature

We organize our discussion of the related literature around the proposed mechanisms for the Medicaid expansion to improve the health status of older adults. In particular, we hypothesize that an increase in health insurance coverage, from either reducing the likelihood of being uninsured or moving to more generous coverage, reduces the financial cost of accessing care, leading to an increase in the use of effective medical care, which ultimately improves health.

Medicaid Expansion and Health Insurance Coverage

The Medicaid expansion may have impacted health insurance coverage through 2 channels. First, the Medicaid expansion increased the number of people with health insurance by providing a more affordable and accessible coverage option than had previously existed. Adults aged 50 to 64, who tend to be less healthy and use more medical care, may have had difficulty obtaining coverage prior to the Medicaid expansion. This is likely due to premiums in the commercial market being high relative to incomes, especially as insurers may have considered older adults higher in risk.[24] This is particularly true for the low-income population targeted by Medicaid.

Second, older, low-income adults may have changed their coverage in response to new Medicaid eligibility. This type of "crowd-out" is plausible among this age group, given the high rates of insurance prior to the expansion. In 2013, the year prior to the major Medicaid expansions, 85.4% of all

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adults ages 45 to 64 were insured, 71.7% had private insurance, and 18.9% had public coverage, including both Medicaid and Medicare.[25] This represents the highest rate of coverage—and private coverage—of all non-elderly adult age groups. Thus, the most likely source of crowd-out is a shift from private coverage to Medicaid; Medicare enrollment might also fall if some no longer apply for disability programs due to new Medicaid eligibility based on income.[26]

Recent research finds evidence consistent with crowd-out among the near-elderly. Studies using the American Community Survey (ACS) found that 2 or more years postexpansion, the increase in Medicaid coverage exceeded the gains in any coverage for near-elderly adults, whether defined as ages 50 to 64[27] or 56 to 64.[28]

Even if Medicaid enrollment represents a change in coverage type rather than new coverage, Medicaid very likely represents more generous insurance coverage than private insurance or Medicare because of Medicaid's low premiums (if any), little to no cost-sharing,[29] and coverage of many services not covered by Medicare or private insurance, such as long-term care, dental,[30] and vision benefits.[31]

Impact on Health

Evidence on how the ACA Medicaid expansion affected health is more mixed.[3-15] However, these prior studies examining morbidity have generally examined all *non*-elderly adults and have not focused on the *near*-elderly. Among the near-elderly we might see larger health improvements from new health care due to their more fragile health, and more recent work has documented improvements in *mortality* among the near-elderly arising from the ACA Medicaid expansion.[9,22,23] This emerging evidence is consistent with the results of a study of the effects of aging into Medicare, which finds reductions in mortality among people admitted to the hospital via the emergency department.[32] Studies examining the impact of Medicare Part D coverage, which represents an increase in coverage generosity, find improvements in cardiovascular mortality[33,34] and mental health.[35] We provide new evidence on whether gaining Medicaid coverage leads to similar morbidity improvements among low-income, near-elderly persons.

Data

We use data from the HRS, a biennial, panel study of adults aged over 50 and their spouses. The HRS contains demographic information and, importantly for this article, insurance status, health measures, and limited measures of OOP spending and health care use. We use restricted HRS data with state geocodes (the Cross-wave Geographic Information Detail file) from 2010 to 2016. We restrict our sample to persons aged 50 to 64 years with income less than 100% of the Federal Poverty Level (FPL) to focus on those eligible for Medicaid in expansion states and not eligible for Exchange subsidies in nonexpansion states. Our analysis sample consists more than 3000 unique individuals who meet our inclusion criteria.

Outcomes

We first examine the effect of the ACA Medicaid expansion on insurance coverage. We measure insurance coverage at the time of survey with mutually exclusive, binary indicators that are defined based on the following hierarchy: (a) has Medicaid; (b) has Medicare; (c) has private employer-provided insurance; (d) has private nongroup insurance; (e) has "other" insurance coverage (e.g., coverage for Veterans); and (f) is uninsured. We present means of the outcome variables in Supplemental Appendix Table A1.

The HRS includes many measures of health status, and we focus on those that build on findings from the existing literature. As we estimate difference-in-differences models, we also focus our discussion on outcomes that meet the parallel trends assumption.

Building on research documenting improvements in cardiovascular outcomes when people gain Medicare Part D coverage at age 65,[32,33] we first examine a composite measure reflecting the presence of metabolic syndrome, which is a set of conditions that often occur together and lead to an increased likelihood of diabetes or heart and blood vessel disease.[36] The HRS includes measures of 3 of these conditions—obesity, diabetes, and high blood pressure (A variable measuring high cholesterol is only available in waves 12 and 13 [i.e., fielded in 2014 and 2016]). Our measure of metabolic syndrome is a variable ranging from 0 to 3, which is the count of these 3 conditions—a higher value corresponds to worse outcomes. We also separately examine the components of metabolic syndrome.

We next examine the count of complications arising from metabolic syndrome. This variable ranges from 0 to 2 and counts whether in this wave the respondent had a stroke or experienced any of the following heart problems: heart attack, coronary heart disease, angina, congestive heart failure, or "other heart problems."

We examine mental health, building on research documenting improvements when people gain Medicare Part D coverage at age 65.[35] We use the index derived from the Center for Epidemiologic Studies Depression (CESD) scale that is a count of the number of depressive symptoms, ranging from 0 to 8. We use the index provided in the RAND HRS data that are derived from the CESD scale. The index is constructed from 8 questions of whether during the past week the respondent felt depressed, felt that everything s/he did "was an effort," sleep was restless, "could not get going," felt lonely, felt sad, enjoyed life, and was happy. Responses to questions on whether the person enjoyed life and was happy are recoded, so that a higher score on the index represents worse mental health.

We also examine mobility, given previous literature showing increases in joint replacement surgery among older adults

switching from private insurance to Medicare.[37] We measure whether the respondent reports any gross motor skills difficulties, which are measured as walking one block, walking across a room, climbing one flight of stairs, and bathing.

Finally, we include the count of difficulties with activities of daily living (ADLs) that the respondent reports, using the definition constructed by Wallace and Herzog[38] that includes difficulties with bathing, eating, or dressing.

Methods

We use a "difference-in-differences" identification strategy, comparing changes over time in outcomes between states exposed to the ACA Medicaid expansion relative to those not exposed.[39] Our regression model is given below:

$$y_{ist} = \beta_0 + \beta_1 Expand_s \times Post_t + \beta_2 X_{ist} + \mu_s + \delta_t + \varepsilon_{ist}$$

where y_{ist} is the outcome for person i residing in state s in year t, $Expand_s$ is a binary variable indicating whether the state expanded their Medicaid program between 2014 and 2016, $Post_t$ is equal to one beginning in the year of expansion, μ_s represents state fixed effects, δ_t represents year fixed effects, and ε_{ist} is the error term. X_{ist} is a vector of covariates. We include the following controls: age, gender, race, ethnicity, educational attainment, marital status, total household income (in 2016 $), and the state unemployment rate. We include a control for veteran status because of documented differences in access to care for uninsured nonelderly veterans relative to uninsured non-veterans.[40] We estimate these difference-in-differences models using ordinary least squares, and when the dependent variable is binary, we estimate linear probability models. We present means of the covariates in Supplemental Appendix Table A2. We identify the states that expanded Medicaid under the ACA using information from the Kaiser Family Foundation.[41] All regressions are weighted using HRS sampling weights and standard errors are clustered at the state level.

The key identifying assumption for our study design is that there are no unobserved factors that might cause trends in the outcome variable to differ between states that expanded Medicaid versus those that did not. We assess the validity of this assumption by comparing pre-existing trends in outcomes between expansion and nonexpansion states. The graphs of the event study analyses are presented in Supplemental Appendix 9, and the *P* value from an *F* test of joint significance of the pretreatment events is presented in the results table for each regression.

We also present 3 sets of robustness checks. First, we exclude those states that partially expanded Medicaid prior to 2014, all of which also expanded Medicaid in 2014, but for whom the 2014 expansion represented less dramatic increases in coverage. These states are Delaware, the District of Columbia, Massachusetts, New York, and Vermont.[11,42] Our second set of robustness checks excludes states that expanded Medicaid after January 1, 2014, and would have had less time in the post period to experience changes in outcomes. These states are as follows: Michigan, New Hampshire, Pennsylvania, Indiana, Alaska, and Louisiana. Our third set of robustness checks addresses the 2-year gap between interview waves of the HRS, which means that questions about health status in 2014 could reflect health conditions that presented for the first time between the 2012 and 2014 surveys (and before the Medicaid expansion was in place). Our third set of robustness checks excludes responses from wave 12.

Results

Effects on Health Insurance

Table 1 contains the results for health insurance. In Column 1, we find that the Medicaid expansion led to a small, statistically insignificant reduction in the rate of uninsurance (while the effect of the expansion on being uninsured is not statistically significant, we note that the 95% confidence interval [CI] includes reductions in the likelihood of being uninsured as large as 8.8 percentage points). Our estimates suggest that this small reduction was the combination of a large increase in Medicaid coverage offset by reductions in other types of coverage. Rates of Medicaid coverage increased by 16 percentage points (Column 2; 95% CI: 0.10, 0.22) while rates of Medicare coverage, employer-provided insurance, and private insurance not through an employer, declined by 4.4 (Column 3; 95% CI: −0.09, 0.001), 4.9 (column 4; 95% CI: −0.12, 0.03), and 3.4 (Column 5; 95% CI: −0.07, 0.001) percentage points, respectively. In results available upon request, we confirm that, in our sample, the reduction in Medicare is matched by a 5.2 percentage point reduction in Social Security Disability Insurance ($t = 1.51$). Only the effects on Medicaid coverage, Medicare, and private insurance not through an employer are statistically significant at the 10% level. We note that, for the Medicare outcome, the parallel trends assumption is not satisfied.

Based on the HRS data, we observe that, prior to the expansion, among this low-income population with insurance other than Medicaid, 23% had employer-provided insurance, 55% had Medicare and 22% had some other type of private insurance. Because private health insurance and even Medicare, particularly among those without private supplemental coverage, both have higher cost-sharing than Medicaid, most of those newly gaining Medicaid may have experienced declines in cost-sharing associated with their coverage change.

In Supplemental Appendix Table A3, we examine whether there was a corresponding reduction in OOP costs in expansion states. We consider 2 measures of OOP spending. The first captures both health insurance premiums and other OOP spending (e.g., co-payments, deductibles, coinsurance, and costs for services not covered) in a measure of monthly OOP spending (the HRS questions concerning premiums and other medical expenses do not match in terms of time period

Table 1. Effect of ACA Medicaid Expansion on Health Insurance Among Low-Income Adults Ages 50 to 64.

	=1 if respondent is uninsured	=1 if respondent has Medicaid	=1 if respondent has Medicare	=1 if respondent has private employer-provided insurance	=1 if respondent has other private insurance
Dependent variable	(1)	(2)	(3)	(4)	(5)
Expansion × post	−0.025	0.159***	−0.044*	−0.049	−0.034*
	(0.033)	(0.030)	(0.022)	(0.038)	(0.018)
Mean of dependent variable for expansion state residents in pre period	0.33	0.35	0.10	0.15	0.06
P value of joint test of pre-treatment events	.80	.22	.05	.40	.93
Observations (person-years)	5383	5383	5383	5383	5383
Unique individuals	3404	3404	3404	3404	3404

Note. The sample consists of respondents to the 2010-16 HRS who are ages 50 to 64 and have income below the federal poverty level. Regressions also include controls for age, gender, race, ethnicity, educational attainment, marital status, veteran status, total household income in 2016 $, state unemployment rate, and state and year fixed effects. (Event study results included in Supplemental Appendix 9.) Sample weights are used in model estimation. Standard errors clustered by state are reported in parentheses. ACA = Affordable Care Act; HRS = Health and Retirement Study. Statistical significance is indicated by ***for the .01 level, **for the .05 level and *for the .10 level.

covered; the HRS asks respondents about their *monthly* private health insurance premiums at the time of the survey but asks about other OOP expenses *over the past 2 years*. We combine these 2 variables to construct a measure of total monthly OOP spending that combines payments for premiums and cost-sharing by calculating the average of monthly other OOP spending and adding it to monthly premiums). We also examine the effect on other, nonpremium OOP spending over the past 2 years.

Although these results are merely suggestive, they are consistent with OOP expenses falling. In Column 1, we find that OOP costs declined by about $54 per month (including premiums) in a pre-post DD comparison, but we lack support for the parallel trends assumption with this measure. In column 2, we document a $992 reduction in costs over 2 years (excluding premiums); this estimate passes the parallel trends assumption but fails to achieve statistical significance ($t = 1.53$). These (fragile) estimates reflect both total (premium plus OOP) and OOP expenses falling by about 40% given pre-period mean monthly total costs of $122 and mean OOP spending over 2 years of $2259. Together, these estimates suggest that OOP costs may fall by between $496 ($992.4/2) and $648 ($54*12) per year. Previous work documented that the Medicaid expansion led to a $382 reduction per year,[43] among low-income adults ages 18 to 64. Thus, these suggestive, larger estimates of reductions between $496 and $648 per year are consistent with our hypothesis that the impact on OOP expenditures would be greater for the near-elderly than for non-elderly adults of all ages.

Effects on Health

In Table 2, we report results for the effects of the ACA Medicaid expansion on health outcomes. We find improvements in physical health and motor skills with no change in mental health; these results are robust in terms of statistical significance and parallel trends assumptions. In Column 1, we find a reduction in the count of conditions underlying metabolic syndrome (obesity, high blood pressure, and diabetes) of 0.16 (95% CI, −0.27, −0.04). From a preperiod mean of 1.3 conditions, this constitutes a reduction of 12%. In Table 3, we present results that separately examine the components of metabolic syndrome. We find no statistically significant reduction in obesity, but document statistically significant reductions in the incidence of high blood pressure and diabetes.

In Column 2, we document a reduction of 0.09 in the number of complications arising from metabolic syndrome (stroke or heart-related complications) (95% CI, −0.15, −0.02). From a mean of 0.22 complications, this is a reduction of 32%. In Table 3, we examine the components of this measure. We note that the stroke outcome does not satisfy the parallel trends assumption (although others do) and caution that the stroke results should thus not be interpreted as causal. We find a 35% reduction in the likelihood a respondent has heart problems (95% CI, −0.12, −0.02).

In Column 3 of Table 2, we find no statistically significant change in mental health, as measured by the CESD index. In Columns 4 and 5, we document improvements in gross motor skills and ADLs. Respondents are 6.6 percentage points less likely to report a gross motor skills difficulty (95% CI, −0.12, −0.01). From a base of 38% of respondents reporting a difficulty walking a block, walking across a room, climbing one flight of stairs, or bathing, this is a reduction of 18%. In Column 5, we document a 0.11 point reduction (95% CI, −0.18, −0.04) in the number of difficulties with bathing, eating, or dressing, which corresponds to a 34% improvement from a mean of 0.33.

Table 2. Effect of ACA Medicaid Expansion on Health Outcomes Among Low-Income Adults Ages 50 to 64.

	Count of conditions underlying metabolic syndrome (obesity, high blood pressure, diabetes)	Count of complications arising from metabolic syndrome (heart problems or stroke)	CESD Index	=1 if reports gross motor skills difficulty (difficulty walking one block, walking across a room, climbing a flight of stairs, or bathing)	Number of ADL difficulties with bathing, eating, or dressing (W&H definition)
Dependent variable	(1)	(2)	(3)	(4)	(5)
Expansion × post	−0.157**	−0.087***	−0.034	−0.066**	−0.112***
	(0.060)	(0.032)	(0.161)	(0.027)	(0.035)
Mean of dependent variable for expansion state residents in preperiod	1.34	0.28	2.75	0.38	0.33
	(1.00)	(0.53)	(2.55)		(0.70)
P value of joint test of pretreatment events	.93	.22	.86	.32	.68
Observations (person-years)	5418	5624	5531	5592	5590
Unique individuals	3439	3540	3478	3511	3509

Note. The sample consists of respondents to the 2010-2016 HRS who are ages 50 to 64 and have income under 100% of the federal poverty level. The count of conditions underlying metabolic syndrome is constructed by taking the sum of 3 binary variables (obesity, diabetes, and high blood pressure). The count of complications arising from metabolic syndrome is constructed by taking the sum of 2 binary variables (stroke and the RAND variable for "any heart problem" which includes heart attack, coronary heart disease, angina, congestive heart failure, or "other heart problems"). The CESD index is the sum of a binary measure of feeling depressed, as though everything is an effort, sleep was restless, felt lonely, felt sad, could not get going, (1- was happy), and (1- enjoyed life) much of the time. The measure of any difficulties with gross motor skills is a binary variable that equals one if the respondent reports any difficulty walking one block, walking across a room, climbing a flight of stairs, or bathing. The count of difficulties with activities of daily living includes difficulty with bathing, eating, or dressing, per Wallace and Herzog.[38] Regressions also include controls for age, gender, race, ethnicity, educational attainment, marital status, veteran status, total household income (2016 $), state unemployment rate, and state and year fixed effects. Sample weights are used in model estimation. Standard errors clustered by state are reported in parentheses. ACA = Affordable Care Act; CESD = Center for Epidemiologic Studies-Depression; ADL = activities of daily living; HRS = Health and Retirement Study.
Statistical significance is indicated by ***for the .01 level, **for the .05 level and *for the .10 level.

Possible Mechanism: Health Care Use

In Supplemental Appendix Table A4, we examine a possible mechanism underlying the improvements in health: increased health care use. We note that, because HRS questions on health care use are fairly limited in scope, we consider this analysis to be exploratory. We first construct a binary variable that equals one if the respondent reports visiting a physician's office more than 10 times in the last 2 years. The second 2 measures are specific to particular conditions: blood pressure medication and having a heart procedure (heart surgery, cardiac catheterization, coronary angiogram, angioplasty, or bypass graft notation). Due to skip patterns in the data, we restrict the sample to those who report having high blood pressure or a heart complication, respectively.

We document a statistically insignificant ($t = 1.71$) 5.7 percentage point increase in the likelihood of visiting a physician more than 10 times in the past 2 years, a 20% increase relative to the pre-expansion mean. In Column 2, we find no increase in the likelihood of taking medication to control high blood pressure among respondents who report having high blood pressure. While this may seem surprising, given evidence that the Medicaid expansion led to increases in prescriptions filled;[42] we note that nearly 80% of respondents with high blood pressure in our sample are already taking blood pressure medication. Among the small subset of respondents who reported having a prior heart complication (heart attack, coronary heart disease, angina, congestive heart failure, or "other heart problems"), the ACA Medicaid expansion increased the likelihood of having a heart procedure by 15 percentage points, or 48% from a mean of 32% ($t = 1.62$).

Robustness Checks

Supplemental Appendix Tables A5 and A6 include evidence from 3 sets of robustness checks. The first 2 address the fact that not all treatment states enacted the Medicaid expansion on January 1, 2014; some expanded Medicaid prior to 2014 and some expanded Medicaid later. In Panel A, we exclude states that expanded Medicaid early and for whom the 2014 expansion may have represented milder changes; our results are robust to this exclusion. In Panel B, we exclude those states that expanded Medicaid after January 1, 2014, because for the states that expanded in 2016, we may not have a full year of post-expansion data. Our results are also robust to this exclusion.

Our third robustness check takes into account the 2-year gap between interview waves of the HRS, which means that questions about health status in 2014 could reflect health conditions that presented for the first time in the years in between the 2012 and 2014 surveys (before the ACA Medicaid expansion was in

Table 3. Effect of ACA Medicaid Expansion on Components of Composite Health Measures Among Low-Income Adults Ages 50 to 64.

	Count of conditions underlying metabolic syndrome (obesity, high blood pressure, diabetes)	=1 if respondent is obese	=1 if respondent reports high blood pressure	=1 if respondent has diabetes	Count of complications arising from metabolic syndrome (heart problems or stroke)	=1 if respondent had a stroke	=1 if respondent had heart problems
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Expansion × post	−0.157**	−0.046	−0.062**	−0.048*	−0.087***	−0.020	−0.068**
	(0.060)	(0.034)	(0.029)	(0.025)	(0.032)	(0.019)	(0.026)
Mean of dependent variable for expansion state residents in preperiod	1.34 (1.00)	0.43	0.62	0.28	0.28 (0.53)	0.09	0.19
P value of joint test of pretreatment events	.93	.88	.73	.55	.22	.02	.21
Observations (person-year)	5418	5434	5616	5624	5624	5629	5626
Unique individuals	3439	3443	3536	3539	3540	3540	3540

Note. The sample consists of respondents to the 2010-2016 HRS who are ages 50 to 64 and have income under 100% of the federal poverty level. The count of conditions underlying metabolic syndrome is constructed by taking the sum of 3 binary variables (obesity, diabetes, and high blood pressure). The count of complications arising from metabolic syndrome is constructed by taking the sum of 2 binary variables (stroke and the RAND variable for "any heart problem" which includes heart attack, coronary heart disease, angina, congestive heart failure, or "other heart problems"). Regressions also include controls for age, gender, race, ethnicity, educational attainment, marital status, veteran status, total household income (2016 $), state unemployment rate, and state and year fixed effects. Sample weights are used in model estimation. Standard errors clustered by state are reported in parentheses. ACA = Affordable Care Act; HRS = Health and Retirement Study.
Statistical significance is indicated by *** for the .01 level, ** for the .05 level, and * for the .10 level.

place). So, in Panel C, we exclude responses from wave 12, which was fielded in 2014. Our results are largely robust to this exclusion.

Falsification Tests

We also present the results of 2 falsification tests. We would expect to find no effect among near-elderly adults with income too high to benefit from the ACA Medicaid expansion nor would we expect the ACA Medicaid expansion to affect health insurance coverage or health among low-income elderly adults who are too old to receive expansion Medicaid. We present these results in Supplemental Appendix Tables A7 and A8. Only one of the coefficient estimates (Medicaid coverage for high-income adults ages 50 to 64) is statistically significant, and in all but 2 cases, the magnitudes are much closer to zero than our baseline estimates. We interpret these results as supportive of our main results: that the ACA Medicaid expansion increased Medicaid coverage and improved physical health among low-income near-elderly adults.

Discussion and Conclusion

Using newly released data from the HRS, we document significant improvements in health among low-income, near-elderly persons due to the ACA Medicaid expansion. We find a 12% reduction in metabolic conditions, a 32% reduction in complications arising from metabolic syndrome, an 18% reduction in the likelihood of having a difficulty with gross motor skills, and a 34% reduction in ADLs. We find no significant changes in mental health. It is also important to note that our health status results apply to low-income, near-elderly persons, and may not generalize to other populations.

Our study contributes to the growing literature documenting the impact of the ACA. Although evidence on the effects of the ACA on health outcomes has been mixed, our work ties closely to new work showing that the ACA led to reductions in mortality for near-elderly adults.[9,22,23] We provide the first evidence of improved morbidity that not only supports the existence of mortality benefits among this group but also indicates that the health benefits of expanded coverage extend beyond mortality reduction to improvements in quality of life. Our focus is on low-income adults who qualify for the Medicaid expansion, but future work should also examine whether there are health improvements for higher income near-elderly adults who may have benefited from reforms to the design of Marketplace or employer-provided health insurance.

Our results suggest that these health improvements may have been driven primarily by a shift toward more generous Medicaid coverage that has little to no cost-sharing and covers more services[44] rather than an increase in the number of people with any coverage. In our sample of low-income, near-elderly adults, nearly 70% of those residing in expansion states had coverage prior to 2014, and we find a small and statistically insignificant reduction in the proportion of people who are uninsured. The rate of Medicaid coverage, however, increased by 16 percentage points, with offsetting reductions in private insurance and Medicare

coverage—which tend to have much higher premiums and cost-sharing.

We caution that although we find robust results of improved physical health, our setting does not provide robust evidence on the mechanism by which Medicaid expansions may have improved health outcomes. While we investigate reductions in cost-sharing and increase in the use of health care services associated with Medicaid expansions, these results are only suggestive, given their imprecision and, in some cases, the existence of pretrends. We find suggestive evidence that the shift toward Medicaid and away from other sources of coverage was associated with dramatic reductions in OOP costs—between $496 and $648 per year. If the reductions were concentrated among those newly enrolled in Medicaid, then this corresponds to an annual savings of at least $3,100 for the newly enrolled ($496/0.16). As such, our results are consistent with prior work documenting that the Medicaid expansion improved consumers' financial health, as measured by medical debt and other financial outcomes such as collections, credit scores, credit card spending, and bankruptcy.[45-50] To our knowledge, this is one of the first studies to provide suggestive, direct evidence on *how* more generous insurance led to improved financial health—through lower OOP spending.[48]

Our analysis also provides suggestive evidence of changes in health care use as a mechanism driving these health improvements. We document statistically insignificant increases in doctor visits and heart procedures associated with the expansion, which is consistent with the evidence on changes in utilization among older adults aging into Medicare.[39] We note 2 limitations with the health care utilization measures in the HRS that prevent us from presenting a more comprehensive analysis. First, many of the measures reflect any use over the entire 2-year period between interviews. In a population with relatively high use of medical care, this will lead to relatively little variation across respondents. For example, the prescription drug use question is phrased, "did you take prescription drugs regularly over the past 2 years." Since 74% of respondents residing in expansion states in the pre-period responded affirmatively (and there are likely some in this population without medical conditions that would need regular prescription drugs), there is relatively little opportunity for improvements in this measure. Changes in intensity, such as adherence or number of drugs taken regularly, which may be more sensitive to expanded coverage, are not captured by this question. Second, many of the questions correspond to certain types of prescription medications that treat specific conditions or specific medical procedures and have skip patterns that result in very small sample sizes. For example, the measure of heart procedure was only available for the 870 respondents who reported that they had a heart condition. Given these limitations, we believe that the lack of statistical significance may be due to low statistical power rather than a null effect. The sign and magnitude of the estimates support the hypothesis of increases in utilization that may generate the health improvements we document.

Our work provides important initial evidence of the ACA Medicaid expansion's impact on the health of near-elderly adults based on new data from the HRS. We find substantial improvements in physical health but not in mental health. Results on health care use suggest that increased utilization may be driving these health improvements. However, the utilization results are imprecisely estimated. Future work should continue to examine these questions using claims data that has larger sample sizes and detailed information on health care use, and clinical data—such as from electronic medical records (EMRs)—that will enrich the literature with additional measures of health and health care use.

By focusing on the near-elderly with low-income, our study also highlights the importance of exploring heterogeneous responses to the ACA. Most existing studies have pooled the near-elderly with younger non-elderly adults ages 19 to 49. Yet, because baseline insurance coverage and health vary by age, we expect the effects of the ACA also to vary by age. In contrast to the insurance gains documented for younger adults, low-income near-elderly adults had relatively high insurance rates before 2014 and did not experience substantial increases in any coverage after 2014. Our results suggest that the ACA benefited this group by providing more generous coverage and reducing OOP expenses. For near-elderly persons, a group with high health care needs, we find strong evidence that the ACA improved physical health along several different measures, which stands in contrast to the mixed evidence on health improvements among broader age groups (e.g., all low-income adults ages 19 to 64). Thus, it is important that researchers consider that the effects of the ACA Medicaid expansion might not be uniform across all non-elderly adults.

Our findings have important policy implications. These results suggest that, even without increases in overall coverage rates, crowd-out by Medicaid can improve health possibly due to Medicaid's lower cost-sharing. Given that the youngest baby boomers are 55, these health improvements will be experienced by a large number of near-elderly. Improved health in the years prior to aging into Medicare may also result in healthier Medicare beneficiaries possibly resulting in lower per capita spending and longer life spans. Finally, we provide new evidence suggesting that increasing insurance generosity may translate into effective care in low-income populations.

Authors' Note

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Supplemental Material

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