Published in final edited form as:

Health Aff (Millwood). 2018 June ; 37(6): 900–907. doi:10.1377/hlthaff.2017.1542.

Medicaid Expansion And Community Health Centers: Care Quality And Service Use Increased For Rural Patients

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Abstract

Medicaid expansion had great potential to affect community health centers (CHCs), particularly in rural areas, because their patients are predominantly low income and disproportionately uninsured. Using data for 2011–15 on all CHCs, we found that after two years Medicaid expansion was associated with an 11.44-percentage-point decline in the share of CHC patients who were uninsured and a 13.15-percentage-point increase in the share with Medicaid. Changes in quality and volume were consistently observed in rural CHCs in expansion states, which had relative improvements in asthma treatment, body mass index screening and follow-up, and hypertension control, along with substantial increases in volumes for eighteen of twenty-one types of visits—particularly those for mammograms, abnormal breast findings, alcohol-related disorder, and other substance abuse disorder. Similar relative gains were not observed in urban CHCs in expansion states. Repealing or phasing out Medicaid expansion could reverse observed gains in quality and service use and could be particularly detrimental to low-income rural populations.

Community health centers (CHCs) in the US aim to provide “comprehensive, culturally competent, high-quality primary health care services”¹ to medically underserved areas and populations, without regard for ability to pay.² Patients served by CHCs are predominantly low income and uninsured or publicly insured through Medicaid;³ they reside in both urban and rural areas.⁴

As a result of the June 2012 Supreme Court ruling in *National Federation of Independent Business v. Sebelius*, the Affordable Care Act (ACA) gave states the option of expanding eligibility for Medicaid to people with incomes of up to 138 percent of the federal poverty

level starting in January 2014. As of January 2018, thirty-two states and the District of Columbia had expanded Medicaid.⁵ CHCs stood to be particularly affected by states' expansion decisions, given that their patient populations are predominantly low income and disproportionately uninsured. For CHC patients, coverage gains may improve access to and increase demand for primary care, specialty care, and prescription drugs, while for CHCs, increased revenue per patient can be invested in expanding staff and scope of services and in quality improvement infrastructure. Collectively, these factors may positively affect both the quality of care and use of primary care services at CHCs in expansion states. These effects may be even more pronounced in rural areas, where people are more likely to be low income, less likely to be employed, and more likely to face significant barriers in accessing care.^{6,7}

Expanded Medicaid eligibility has been associated with reductions in uninsurance,^{8,9} mortality,¹⁰ and psychological distress,⁹ as well as increases in glucose checks for patients with diabetes¹¹ and visits for preventive care and chronic conditions.^{11,12} In CHCs, Medicaid expansion has been associated with marginal increases in total visits and mental health visits,¹³ as well as gains in insurance coverage and quality of care after one year.¹⁴ While rural CHCs may be particularly affected by expansion,^{15–17} research in this area is limited.

This study extends prior work in two ways. First, we used nationally representative data to assess the two-year impact of Medicaid expansion on insurance coverage and quality of care at CHCs. Examining the two-year impact is critical because full effects might not be observable in one year's time. Second, we examined the impact of expansion on the volume of CHC services for specific chronic conditions, preventive visits, and mental health and substance abuse care, which are regarded as "sentinel indicators of access to primary care,"¹⁸ as well as the differential impact of Medicaid expansion on CHCs in urban versus rural areas.

Study Data And Methods

DATA SOURCE AND STUDY POPULATION

For all analyses, we used data for 2011–15 or 2012–15 from the Uniform Data System. The data, collected annually by the Bureau of Primary Health Care of the Health Resources and Services Administration (HRSA), include information on patients' demographic characteristics, quality measures, visit counts, and organizational and structural features for every CHC in the US that received federal funding from HRSA, as authorized by section 330 of the Public Health Service Act. We excluded 52 centers in states that expanded eligibility for Medicaid in 2015;¹⁹ 29 centers in US territories; 2 centers that had only sites that were school based, mobile, or seasonal; and 186 centers that either were newly established after 2011 or lost CHC status after 2011. Our final sample size was 1,009 CHCs in each year. These centers treated 18.5 million patients in 2011 and 21.2 million in 2015.

TREATMENT GROUP DEFINITION

Our treatment group included all 578 CHCs in states that had expanded Medicaid by 2014. It thus included states that had expanded Medicaid before 2014, though these states were excluded in sensitivity analyses. Our control group included all 431 CHCs in states that had not expanded Medicaid by 2014 (see online appendix exhibit 1A).²⁰

OUTCOMES

We examined three main outcomes: insurance coverage (the percentages of patients without insurance, with Medicaid coverage, and with private insurance); quality of care for eight quality measures potentially sensitive to Medicaid expansion; and patient and visit volumes (numbers of unique patients and of twenty-one types of visits per CHC).

The quality measures included pharmacologic treatment of patients with asthma, provision of lipid-lowering therapy for patients with coronary artery disease, provision of aspirin for patients with cardiovascular disease, body mass index (BMI) screening and follow-up in adults, Pap testing, colorectal cancer screening, blood pressure control (less than 140/90 mmHg) in patients with hypertension, and blood sugar control (glycosylated hemoglobin at or below 9 percent) in patients with diabetes. The two intermediate outcomes (control of hypertension and diabetes) were also examined by race/ethnicity. The twenty-one types of visits were based on diagnoses or services rendered as indicated by *International Classification of Diseases*, Ninth Revision (ICD-9), and *Current Procedural Terminology*, Fourth Edition (CPT-4), codes, regardless of the primary reason for visit, and included visits for chronic conditions, preventive services, and mental health and substance abuse services.

In examining the differential effect of expansion for CHCs that served urban versus rural patients, we considered a CHC urban based on the location of its patient population using Rural-Urban Commuting Area Codes,²¹ as further described in appendix exhibit 3A.²⁰

STATISTICAL ANALYSIS

We conducted a difference-in-differences analysis to compare outcomes in CHCs in expansion versus nonexpansion states, before and after expansion, using the CHC as the unit of analysis. The difference-in-differences approach allows for mean baseline differences between groups, where CHCs in expansion states serve as their own controls and the comparison group of CHCs in nonexpansion states accounts for secular trends.²²

To further account for differences between CHCs in expansion versus nonexpansion states, we used inverse probability of treatment weights based on propensity scores to balance all observable characteristics between the treatment and control groups. The propensity scores included twenty-one baseline characteristics measured at the center level, such as patients' demographic characteristics and CHCs' structural and organizational characteristics, including levels of section 330 funding (see appendix D for the complete list).²⁰ After we generated the propensity scores, we found that the distribution of each covariate was balanced between the treatment and control groups,²³ with a standardized difference of no more than 10 percent²⁴ (appendix exhibit 6A).²⁰ We calculated the treatment weights using the propensity scores, where the weight was equal to the inverse probability of receiving the

treatment that was actually received.^{25,26} Weights were stabilized to a mean of one and truncated at the ninety-ninth percentile to avoid the influence of extreme weights.

To estimate the impact of Medicaid expansion on insurance and quality of care in CHCs, we used linear probability models with the inverse probability of treatment weights, which provided direct estimates of absolute changes.²⁷ To estimate the effect of Medicaid expansion on numbers of unique patients and visits, we used generalized linear models that assumed a negative binomial distribution with log link, which provided relative effect estimates as captured by an incidence rate ratio (IRR). An IRR greater than 1.0 indicated that Medicaid expansion was associated with an increase in the outcome, whereas an IRR less than 1.0 indicated that expansion was associated with a decrease.

All models included the main effects (indicators for Medicaid expansion and number of post-period years), as well as an interaction between the Medicaid expansion and post-period indicators (the difference-in-differences), a year indicator to account for secular time trends, the percentage of patients with managed care to account for imbalance in the propensity scores, and state fixed effects. We also included a vector of time-variant confounders related to our outcomes (adoption of electronic health records, medical home recognition, section 330 funding, ACA Capital Development Grants and other federal funding sources, and percentage of homeless patients) to account for differential changes in the post period between centers in expansion versus nonexpansion states. All observations were clustered at the center level to account for repeated measures. We used robust sandwich variance estimators to account for weights.

To examine the differential effect of Medicaid expansion on CHCs in urban versus rural areas, we added a three-way interaction of the expansion, post-period, and urban-rural indicators (see appendix C for detailed specifications).²⁰

Details on sensitivity analyses and robustness checks are presented in appendixes C and G.²⁰

LIMITATIONS

Our study had several limitations. First, data were reported at the CHC level, which limited our ability to adjust for patient-level factors. While this may have resulted in some unmeasured confounding, to the extent that patient-level confounders changed differentially in the post period for centers in expansion versus nonexpansion states, these measures are not adjusted in HRSA's monitoring and reporting. Center-level data also mask the counteractive effects of patient movement in and out of CHCs, so we observed only aggregate changes. This means that the observed effects are likely the result of the aggregate 11-percentage-point relative shift in coverage, where the majority of CHC patients have coverage both before and after expansion. A patient-level analysis focusing on patients who gained coverage would likely yield significantly larger effect sizes.

Second, information from the Uniform Data System is reported by CHCs and subject to measurement error. However, error is likely correlated within centers across time, and we have no reason to believe that the direction of error is differential in expansion versus nonexpansion states.

Third, we examined two years of data following expansion, but improvements in intermediate outcomes may require a longer period to materialize.

Finally, policy changes in the post period that affected the outcomes may have differed in expansion versus nonexpansion states. While our methodological approach partially accounted for this, residual confounding may exist.

Study Results

We observed some differences in unadjusted patient and CHC baseline characteristics between CHCs in expansion versus nonexpansion states. Compared to CHC patients in nonexpansion states, in 2013 patients in expansion states were more likely to be Hispanic, be insured, have Medicaid coverage, be homeless, have managed care, and live in an urban area, for instance (exhibit 1). And compared to CHCs in nonexpansion states, those in expansion states were more likely to have medical home recognition and to have received less federal health center funding per patient. Baseline characteristics for patients of urban versus rural CHCs are shown in exhibits 7A-1 and 7A-2 in appendix E,²⁰ which indicates that those in rural areas were more likely to be white, have incomes above poverty, and have private insurance or Medicare. Unadjusted baseline quality outcomes were similar for most measures when we compared urban versus rural CHCs in expansion versus nonexpansion states (exhibit 7A-3, appendix E).²⁰

EFFECTS ON INSURANCE COVERAGE

As shown in appendix E (exhibit 9A)²⁰ and in exhibit 2, compared to the 2011–13 pre period, in 2015 Medicaid expansion was associated with an 11.44-percentage-point decrease (95% confidence interval: –13.67, –9.21) in the proportion of uninsured CHC patients and a 13.15-percentage-point increase (95% CI: 11.73, 14.57) in patients with Medicaid coverage, compared to similar centers in nonexpansion states. Rates of private insurance coverage increased for CHC patients in both expansion and nonexpansion states, though there was a smaller increase in expansion states (a difference-in-differences of –2.15 percentage points [95% CI: –3.43, –0.87]) in 2015. For all insurance outcomes, the 2014 and 2015 estimates were similar, which means that the effect of expansion on insurance was sustained in the second year. Additionally, despite these gains in insurance coverage, unadjusted estimates showed that about 20 percent of CHC patients in expansion states and 37 percent of those in nonexpansion states remained uninsured in 2015 (exhibit 8A, appendix E).²⁰ The effect of expansion on insurance coverage and type was statistically similar for patients in urban areas and those in rural areas.

EFFECTS ON QUALITY OF CARE

CHCs in urban areas did not experience significant changes in quality of care due to expansion (exhibit 3). However, in rural areas, compared to no expansion, Medicaid expansion was associated with relative improvements in 2015 in the percentages of patients with asthma receiving appropriate pharmacologic treatment (an increase of 3.5 percentage points; 95% CI: 0.1, 6.9), adults receiving a BMI screening and follow-up if needed (6.7 percentage points; 95% CI: 0.7, 12.7), and blood pressure control for patients with

hypertension (2.1 percentage points; 95% CI: 0.2, 4.0). Relative gains in blood pressure control associated with expansion were largest for Hispanic patients in rural areas (5.2 percentage points in 2015; 95% CI: 0.1, 10.3). Rural CHCs also experienced marginally significant improvements in the percentages of patients receiving a Pap test in 2014 and had positive coefficients for all but one quality measure in 2015.

EFFECTS ON PATIENT AND VISIT VOLUMES

Overall, Medicaid expansion was not associated with a differential rate of change in numbers of unique patients served per CHC (exhibit 12A, appendix E),²⁰ although numbers of patients did increase in both expansion and nonexpansion states. For urban CHCs, Medicaid expansion was associated with a marginally significant decline in the number of patients per center (IRR in 2015: 0.95; 95% CI: 0.90, 1.01), while rural CHCs experienced a small, marginally significant increase (IRR in 2015: 1.04; 95% CI: 0.99, 1.09) (exhibit 4).

Medicaid expansion was associated with a significant ($p < 0.05$) increase in numbers of visits for thirteen of the twenty-one visit types in either 2014 or 2015 (exhibit 13A-1, appendix E).²⁰ However, these effects were driven largely by changes in rural areas. As shown in exhibit 4, for rural CHCs, Medicaid expansion was associated with significant increases in numbers of visits for eighteen of the twenty-one types in either 2014 or 2015. In 2015 the relative effects were largest for visits for mammograms (IRR: 1.46; 95% CI: 1.12, 1.91), abnormal breast exam findings (IRR: 1.64; 95% CI: 1.09, 2.49), alcohol-related disorder (IRR: 1.46; 95% CI: 1.19, 1.78), and other substance abuse disorder (IRR: 1.73; 95% CI: 1.19, 2.51). In urban centers, Medicaid expansion was associated with significant increases in visits only for Pap tests, abnormal cervical result, and tobacco use disorder.

Discussion

The first two years of Medicaid expansion were associated with increased rates of insurance and Medicaid coverage among community health center patients. We found that in rural areas, Medicaid expansion was associated with relative improvements in asthma treatment, BMI screening and follow-up, and blood pressure control in patients with hypertension, and substantial increases in the numbers of visits per center related to chronic conditions, preventive care, and treatment for mental health and substance abuse. However, gains in quality and increases in visit volume due to expansion were not similarly observed in urban CHCs in expansion states. Additionally, about one in five patients in expansion states remained uninsured in 2015.

Our findings on insurance coverage and quality are largely consistent with the results in other literature that examined the two-year impact of expansion. For instance, Sandra Decker and coauthors⁸ found that for low-income adults, Medicaid expansion was associated with a 6.8-percentage-point relative decrease in uninsurance by 2015, while Stacey McMorro and coauthors⁹ found the effect size to be 2.3 percentage points by 2015 for low-income parents. We extend these findings to the CHC population, where the magnitude of the effect on coverage appears to be greater than that in the general low-income population. Furthermore, Benjamin Sommers and coauthors¹² found that among low-income adults in Kentucky and Arkansas, expansion was associated with an 11.1-

percentage-point increase in glucose checks for patients with diabetes and a 16.0-percentage-point increase in having an annual checkup in 2015. However, while pre-ACA studies in Oregon and Massachusetts suggested that Medicaid expansion was associated with aggregate increases in CHC patient volume,^{28,29} we found differential changes in urban versus rural areas.

The fact that asthma treatment and hypertension control are two of the measures most affected by expansion may reflect the high cost of prescriptions necessary to manage these conditions, particularly for asthma.^{30,31} Uninsured patients might not be able to afford medications, even with the discounted drug programs available through CHCs. Moreover, while we observed relative increases in numbers of visits, translating these results to increases in absolute numbers of visits suggests a large impact at the population level: In rural centers alone, approximately 437,000 visits for depression, 141,000 visits for Pap testing, and 457,000 visits for hypertension resulted from expansion in two years—totals that would likely be much higher if more states had expanded Medicaid.

We observed a consistent differential effect of Medicaid expansion on quality and patient volume, particularly for numbers of visits—with expansion associated with large increases in visit volumes in rural areas. This suggests that expansion is particularly important for rural areas and may increase access to primary care for low-income patients in these areas, especially for mental health and substance abuse services.

The differential effect of expansion on visit volumes in urban versus rural areas is likely due to the fact that patients in urban areas have greater access to non-CHC providers. There are fewer primary care providers in rural areas outside of CHCs.³² Thus, patients in those areas are more likely to use CHCs when they gain coverage. For this reason, “urban” versus “rural” may be a proxy for regional primary care capacity. When one considers the differential effect of expansion on quality, it is possible that urban patients who receive care outside of CHCs after gaining coverage are on average healthier, have higher incomes, and have a different sociodemographic profile than those who elect to continue receiving care at a CHC. This may attenuate the effect of expansion on the quality of care in urban areas, but that is not testable using CHC-level data. While further research is warranted, the possibility is supported by the fact that at baseline, CHCs in rural areas had significantly higher proportions of patients with Medicare and private insurance, compared to CHCs in urban areas.

Furthermore, while our approach aimed to isolate the effect of Medicaid expansion on CHCs, their structural and financial environments changed substantially during the study period. For instance, the ACA allocated \$11 billion to finance the operation, expansion, and construction of health centers. These new ACA funds and other changes in federal funding do not explain our findings, because we accounted for such changes in our methodological approach, and the ACA’s investment preceded Medicaid expansion. However, prior research has documented the importance of federal grant funding in increasing CHCs’ capacity to provide care.¹³ The failure to extend funding in future years could compromise quality and decrease visit volume to the extent that lesser funding constrains CHCs’ capacity to serve the newly insured in expansion states. Furthermore, recent evidence suggests that medical

home designation for CHCs is associated with improvements in quality of care.^{33–35} Since CHCs in nonexpansion states have lower rates of medical home recognition, future Medicaid expansions may partially mitigate any disadvantages that these states may face related to quality improvement.

Our findings have important implications for CHCs specifically and for policy generally. To the extent that current law remains in effect, further gains in quality and increases in visit volumes are likely if more eligible patients enroll in insurance coverage, especially if more states expand Medicaid. Gains would likely be greater for CHCs in current nonexpansion states, should they expand Medicaid, as these states have higher baseline levels of uninsurance and are more rural, on average. Expansion may be particularly important to rural CHC patients, who have access to fewer primary care providers, and may serve as a mechanism for reducing disparities that persist between urban and rural regions.

More broadly, these findings add to the evidence base available to the federal government in light of continued congressional discussions about changing or repealing some aspects of existing Medicaid law. If the Medicaid expansion were repealed or federal financing for Medicaid were capped, millions of low-income people would lose coverage.³⁶ For CHCs and their patients, this could reverse the positive effects of expansion that we observed on quality and capacity, and these changes would be particularly detrimental in rural areas. Our results also highlight the continued importance of federal funding for CHCs, since such funding allows them to care for uninsured patients and provide comprehensive services to all patients, including enabling services—nonclinical services that facilitate access to care. This may be especially important for mitigating any negative effects of not expanding Medicaid, as CHCs in nonexpansion states have not benefited from gains in Medicaid revenue and continue to have high proportions of patients who lack insurance.

Conclusion

In CHCs, the first two years of Medicaid expansion were associated with gains in insurance coverage, improvements in quality of care for asthma treatment, increases in BMI assessment and follow-up and in blood pressure control, and substantial increases in visit volumes—including visits for chronic conditions, preventive services, and mental health and substance abuse services. The changes in quality of care and visit volumes were concentrated in rural CHCs. Repealing or restricting Medicaid expansion may reverse these positive effects and be particularly detrimental to low-income, rural populations.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

An earlier version of this work was presented in a podium presentation at the AcademyHealth Annual Research Meeting, New Orleans, Louisiana, June 27, 2017. Funding for this work was provided by the Agency for Healthcare Research and Quality (Grant No. 1R36HS024652-01).

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EXHIBIT 2.

Percentages of community health center patients by type of coverage and state Medicaid expansion status, 2011–15

SOURCE Authors' analysis of data for 2011–15 from the Uniform Data System. **NOTES** The estimates shown represent the yearly marginal rates, using inverse probability of treatment weights that adjusted for all covariates shown in exhibit 1. The baseline rates (for the period 2011–13) appear similar for patients in both expansion and nonexpansion states because of weighting. Full model estimates, including difference-in-differences estimates, are in online appendix E (see note 20 in text). All differences-in-differences between expansion and nonexpansion states from 2011–13 compared to 2014 and from 2011–13 compared to 2015 were significant ($p < 0.001$).

EXHIBIT 1

Unadjusted characteristics of community health centers and their patients in 2013, by state Medicaid expansion status

	<u>Centers in states that were:</u>		<i>p</i> value of difference
Characteristic	Expansion ^{<i>a</i>}	Nonexpansion ^{<i>b</i>}	
PATIENT CHARACTERISTICS			
Age range (years)			
Less than 18	27.8%	26.3%	0.050
18–64	64.0	64.7	0.353
65 or more	8.2	9.0	0.025
Sex			
Male	43.1	42.5	0.181
Race/ethnicity			
White non-Hispanic	42.2	46.6	0.025
Black non-Hispanic	15.7	23.9	<0.001
Asian non-Hispanic	3.7	1.1	<0.001
American Indian or Alaskan Native non-Hispanic	1.4	3.8	<0.001
Hispanic	29.9	20.8	<0.001
Income (percent of federal poverty level)			
Less than 100	68.5	67.8	0.536
Less than 200	92.0	91.5	0.425
Insurance coverage			
Uninsured	33.0	43.9	<0.001
Medicaid	39.4	27.4	<0.001
Medicare	9.3	9.9	0.152
Private insurance	16.1	17.8	0.041
Other public coverage	2.3	1.0	<0.001
Other patient characteristics			
Homeless	10.6	6.2	0.003
Primary language other than English	19.3	12.5	<0.001
Comprehensive managed care	24.8	10.8	<0.001
HEALTH CENTER CHARACTERISTICS			
Mean patients per center	22,729	15,064	<0.001
Urban	49.5%	33.2%	<0.001
Medical home recognition	65.2%	55.0%	0.001
Electronic health record adoption	96.9%	97.2%	0.761
Section 330 funding per patient	\$146	\$210	<0.001

SOURCE Authors' analysis of data for 2013 from the Uniform Data System. **NOTES** Section 330 (explained in the text) funding represents the total amount of community health center, migrant health, homeless, and public housing funding per patient served.

^a 578 centers, or 13.1 million patients.

^b 431 centers, or 6.5 million patients.

EXHIBIT 3

Estimated impact of state Medicaid expansion status on quality of care at urban and rural community health centers (CHCs), 2011–15

Quality measure	<u>All CHCs</u>		<u>Urban CHCs</u>		<u>Rural CHCs</u>	
	2014	2015	2014	2015	2014	2015
PROCESS						
Pharmacologic treatment of patients with asthma	3.4**	0.1	2.7	−5.1	3.9**	3.5**
Lipid-lowering therapy for patients with coronary artery disease	0.5	0.5	−1.9	0.4	0.9	0.7
Aspirin for patients with cardiovascular disease	−1.3	−0.3	0.8	0.1	−2.7	−0.8
Colorectal cancer screening	0.8	1.8	1.5	1.3	−0.1	2.0
Pap testing	1.4	1.1	−0.1	0.3	2.7*	2.0
BMI screening and follow-up in adults	5.0**	4.6*	3.1	−1.2	4.3*	6.7**
OUTCOME						
Blood pressure control						
All patients	1.5**	0.8	−0.4	−1.1	2.8**	2.1**
White non-Hispanics	0.4	0.2	−2.3	−3.4*	2.3**	2.6**
Black non-Hispanics	2.4	0.7	1.8	−0.7	2.9	1.8
Hispanics	3.9*	4.1**	−0.1	−1.1	3.9	5.2**
Diabetes control						
All patients	0.6	1.4	1.3	1.6	0.1	1.3
Non-Hispanic whites	0.9	1.5	0.9	1.2	0.7	1.8
Non-Hispanic blacks	−2.0	0.8	−1.0	0.7	−2.6	1.0
Hispanics	0.2	−1.6	−1.5	−1.5	2.8	1.9

SOURCE Authors' analysis of data for 2011–15 from the Uniform Data System. **NOTES** All differences are absolute percentage-point differences derived from linear probability models. Estimates shown for 2014 are differences-in-differences between centers in expansion and nonexpansion states from 2011–13 compared to 2014. Estimates shown for 2015 are the differences-in-differences between expansion and nonexpansion states from 2011–13 compared to 2015. Differences-in-differences represent the coefficient of the interaction between expansion status and postexpansion time, using inverse probability of treatment weights, controlling for main effects, and adjusting for all covariates listed in appendix C (see note 20 in text). Pre- and post-period marginal rates by expansion status are in appendix E (see note 20 in text). BMI is body mass index.

* $p < 0.10$

** $p < 0.05$

EXHIBIT 4

Estimated impact of state Medicaid expansion status on patient and visit volumes at urban and rural community health centers (CHCs), 2012–15

	Urban CHCs		Rural CHCs	
	2014	2015	2014	2015
Unique patients per center	0.97 [*]	0.95 [*]	1.04 ^{**}	1.04 [*]
Visits per center for: Chronic conditions				
Diabetes	0.97	0.94	1.15 ^{**}	1.15 ^{***}
Heart disease	0.97	0.97	1.32 ^{***}	1.25 ^{***}
Hypertension	0.98	0.98	1.13 ^{**}	1.12 ^{**}
Overweight or obesity	1.05	0.92	1.30 ^{**}	1.20 [*]
Asthma	0.92 ^{**}	0.87 ^{**}	1.11 ^{**}	1.05
Hepatitis C	0.81 ^{***}	0.84 ^{**}	1.41 ^{***}	1.26 ^{**}
Preventive services				
Contraceptives	1.04	0.99	1.05	0.91
Flu vaccine	1.04	0.99	1.20 ^{**}	1.17 [*]
Hepatitis C test	0.81 ^{***}	0.84 ^{**}	1.41 ^{***}	1.26 ^{**}
HIV test	0.84 ^{**}	0.81 [*]	1.15	1.12
Pap test	1.08 ^{**}	1.11 ^{**}	1.19 ^{***}	1.15 ^{**}
Mammogram	1.06	0.92	1.53 ^{***}	1.46 ^{***}
Sexually transmitted infection	0.86 [*]	0.87	1.09	1.05
Abnormal breast result	1.14 [*]	1.14	1.87 ^{**}	1.64 ^{**}
Abnormal cervical result	1.04	1.19 ^{***}	1.26 ^{***}	1.16 [*]
Mental health and substance abuse services				
Alcohol-related disorder	0.86 [*]	0.96	1.49 ^{***}	1.46 ^{***}
Other substance abuse disorder	1.06	1.08	1.48 ^{***}	1.73 ^{***}
Tobacco use disorder	1.24 ^{**}	0.97	1.38 ^{***}	1.42 ^{***}
Depression	0.95	0.91	1.22 ^{***}	1.22 ^{***}
Anxiety	0.95	0.92	1.27 ^{***}	1.31 ^{***}
Other mental health	0.98	0.82	1.22 ^{***}	1.25 ^{**}

SOURCE Authors' analysis of data for 2012–15 from the Uniform Data System. **NOTES** Differences-in-differences (explained in the notes to exhibit 3) are reported as incidence rate ratios (IRRs): An IRR greater than 1.00 indicates that expansion was associated with an increase in the outcome, and an IRR less than 1.00 indicates that it was associated with a decrease in the outcome. Full regression results and pre- and post-period marginal rates by expansion status are in appendix E (see note 20 in text).

^{*}
 $p < 0.10$

^{**}
 $p < 0.05$

^{***}
 $p < 0.01$

 $p < 0.001$

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