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Medicaid coverage expansions and cigarette smoking cessation among low-income adults

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Abstract

Introduction—Expanding Medicaid coverage to low-income adults may have increased smoking cessation through improved access to evidence-based treatments. Our study sought to determine if states' decisions to expand Medicaid increased recent smoking cessation.

Methods—Using pooled cross-sectional data from the Behavioral Risk Factor Surveillance Survey for the years 2011–2015, we examined the association between state Medicaid coverage and the probability of recent smoking cessation among low-income adults without dependent children who were current or former smokers (n=36,083). We used difference-in-differences estimation to examine the effects of Medicaid coverage on smoking cessation, comparing low-income adult smokers in states with Medicaid coverage to comparable adults in states without Medicaid coverage, with ages 18–64 years to those ages>=65 years. Analyses were conducted for the full sample and stratified by sex.

Results—Residence in a state with Medicaid coverage among low-income adult smokers ages 18–64 years was associated with an increase in recent smoking cessation of 2.1 percentage points (95%CI: 0.25, 3.9). In the comparison group of individuals ages>=65 years, residence in a state with Medicaid coverage expansion was not associated with a change in recent smoking cessation (−0.1 percentage point, 9% CI: −2.1, 1.8). Similar increases in smoking cessation among those

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Declaration of Interests

The authors declare that they do not have any conflicts of interest.

ages 18–64 years were estimated for females and males (1.9 and 2.2 percentage-point, respectively).

Conclusion—Findings are consistent with the hypothesis that Medicaid coverage expansions may have increased smoking cessation among low-income adults without dependent children via greater access to preventive healthcare services, including evidence-based smoking cessation services.

INTRODUCTION

Cigarette smoking remains a leading cause of morbidity and premature mortality among U.S. adults.[1] After decades of public health efforts to promote smoking cessation, nearly 15% of U.S. adults smoke cigarettes.[2] Although smoking has declined dramatically among the population at large, low-income adults face a disproportionately high burden of smoking; nearly 30% of low-income adults are smokers.[2] Further, smoking is costly for health care systems, as smoking is responsible for 9% of annual healthcare spending in the United States.[3] The cost of healthcare spending attributable to smoking could be even greater, as research has shown that smoking may be associated with an even greater burden of disease than previously believed.[4] The burden of financing this excess healthcare due to smoking falls disproportionately on public payers, such as Medicaid and Medicare.[3]

The Affordable Care Act (ACA) in 2014 provided states the option to expand Medicaid to all individuals with household incomes less than 138% of the federal poverty level, including low-income adults without dependent children or qualifying disabilities. Prior to the ACA Medicaid expansion, however, some states chose to expand Medicaid coverage to low-income adults via the implementation of Medicaid waivers. Without Medicaid coverage, most low-income adults have little access to care, including smoking cessation services.[5] Previous studies have suggested that insurance coverage has a positive effect on smoking cessation.[6,7,8] More specifically, prior research has shown that more generous coverage of smoking cessation in Medicaid before ACA Medicaid expansions was associated with 3 percentage-point increase in smoking cessation,[8] while a study conducted in Massachusetts showed that 40% of recent enrollees used tobacco smoking cessation benefits in the first 2.5 years of enrolling.[9] Further, a cohort study of patients in community health centers showed that recent enrollees had a 40% increase in the odds of quitting smoking and triple the odds of ordering smoking cessation medication.[6]

Starting in 2014, state Medicaid programs were required to cover smoking cessation services among newly eligible adults.[10] For those adults covered by Medicaid prior to the ACA expansion, states had discretion about which smoking cessation services to cover. However, the large majority of state Medicaid programs provided coverage for effective smoking cessation medications prior to the ACA expansion.[11] Thus, state expansion of Medicaid coverage to all low-income adults may have led to increased smoking cessation through improved access to primary care and to evidence-based smoking cessation treatments.

No national research, to our knowledge, has examined whether Medicaid coverage is associated with an increase in recent smoking cessation among low-income adults who previously were ineligible for Medicaid coverage. Our study took advantage of state

variation in the timing of expanding Medicaid coverage to non-elderly adults without dependent children to determine if the ACA Medicaid expansion was associated with a decrease in smoking. We hypothesized that low-income adult current or former smokers residing in states with Medicaid coverage would have increased access to smoking cessation services through increased access to smoking cessation services.

METHODS

Data and Study Sample

We used pooled cross-sectional data from the annual Behavioral Risk Factor Surveillance System data (BRFSS) in 2011–2015. BRFSS is an annual mobile and landline telephone survey of health behaviors, chronic conditions, and use of preventative measures for adults ages ≥18. BRFSS items measuring health care access have been shown to be highly reliable and valid.[12,13] Because this secondary data analysis was conducted using publicly available data set with de-identified participants, this study does not meet the federal definition of human subjects research, and the institutional review board (IRB) approval was not needed.

We included adult, non-pregnant smokers and former smokers without qualifying disabilities or dependent children in the home who resided in the 50 states and Washington, DC, and who had incomes <100% of the federal poverty level (FPL). We restricted the sample to current and former smokers, defined by respondent self-report. Current smokers self-identified as smoking every day or some days, and former smokers self-identified as not having smoked in the past month. Within that sample, we created a variable to indicate whether an individual was Medicaid-eligible in their state in a given year, based on self-reported income and household size. Medicaid eligibility is defined for individuals based on their household income as a percentage of the FPL. BRFSS asks respondents for their household income in the past 12 months along with the number of people who rely on that income. Annual household income was measured by BRFSS in categorical increments ranging with <$10,000 to ≥$75,000. To estimate household income, we took the midpoint of the income category for each respondent and treated it as the household income amount.[14] This household income amount was then compared with the annual federal poverty guidelines by household size to convert dollar income to income as a percentage of the FPL. The unweighted sample for our study was 36,083 respondents (weighted n= 18,493,506), including 25,738 people ages 18–64 years (weighted n= 15,148,712) and 10,345 people ages>=65 years (weighted n= 3,344,793).

Outcome measures

The outcome of interest was the probability of recent smoking cessation. Consistent with prior research, recent smoking cessation was defined based on respondents' self-reports of being a former smoker in the past year, but not having smoked a cigarette within the past month.[15] An alternate outcome measure might be overall smoking prevalence, which would change with both smoking cessation and smoking prevention. Because we expected Medicaid expansion to affect smoking cessation (and to have little to no effect on smoking prevention), we chose to measure smoking cessation.

Intervention and Comparison Groups

We defined the intervention group as individuals ages 18–64 years residing in the 31 states that had adopted comprehensive Medicaid coverage for low-income adults without dependent children as of 2015. This included 16 states that expanded Medicaid coverage for low-income adults without dependent children through the ACA option in 2014 or 2015, and 15 states that offered comprehensive Medicaid waiver coverage prior to the ACA in 2011 or earlier. To determine the status of state Medicaid expansion, we used Kaiser Family Foundation annual surveys, which collect data from Medicaid policy makers each year via structured phone interviews.[16] We considered any state that had either state-funded Medicaid coverage or early adoption of the ACA expansion for adults without dependent children with income up to 100% FPL to have Medicaid expansion prior to 2014. We compared changes in smoking cessation over time in this intervention group to a within-state comparison group comprised of low-income current and former smokers age>=65 years. Individuals in the comparison group would be eligible for Medicare and would have no policy change in insurance eligibility over our study time period. Table 1 summarizes Medicaid coverage for adults without dependent children, by state and year.

Covariates

Analyses controlled for individual characteristics: age group (defined as 18–64 years vs. age>=65 years), sex, race (defined as white, black, Asian, other), and education (less than high school, high school, or more than a high school education). We considered controlling for individuals' health insurance status, but that variable was highly collinear with our indicator of state Medicaid coverage and with year. Analyses also controlled for relevant state policies that might be causally associated with smoking cessation: i.e., state cigarette taxes and state clean indoor air laws, using publicly available data published by the Centers for Disease Control and Prevention. Cigarette taxes were defined as the amount that each state levied per pack of cigarettes. Comprehensive indoor air laws were defined as state laws prohibiting smoking in private-sector workplaces, restaurants, and bars.[17]

Statistical Analysis

To ensure that our intervention and comparison groups of individuals were comparable on observed characteristics, we first calculated descriptive statistics of the study population, overall and stratified by state Medicaid coverage status, both in the intervention group (ages 18–64 years) and comparison group (ages>=65 years). We additionally assessed time trends in health insurance coverage, and the report of forgoing medical care due to cost in the prior year, among those ages 18–64 years, to test our assumption that those in the intervention group would report increased access to care. These results are shown in Figure 1.

Our analysis used a difference-in-differences estimation to estimate the effects of expansion on recent smoking cessation.[18] This approach simulates an experiment by examining the effects of the adoption of Medicaid expansions and subtracting the differences in outcomes for the comparison group (age>=65 years who are ineligible for Medicaid expansion and covered in Medicare) from the outcomes observed in the intervention group (ages 18–64 years who are eligible for Medicaid expansion), which reduces biases that could result from

trends unrelated to the intervention group.[18] The empirical model takes the following general form:

$$Y_{ist}=\beta_0+\beta_1 Mcd_{st}+\beta_2 Age65_{ist}+\beta_3 Mcd_{st}*Age65_{ist}+\beta_4 State_{st}+\beta_5 Year+\beta_6 X_{ist}+\varepsilon_{is}$$

Where Y_{ist} is the probability recent smoking cessation for individual i in state s and time t. Mcd_{st} is a measure of exposure to Medicaid expansion, $Age65_{ist}$ indicates age>=65 years vs. age 18–64 years, $State_{st}$ is a measure of state of residence, X_{ist} is a vector of individual and state-level covariates, and ε_{ist} is a residual term.

For our main outcome of smoking cessation, we estimated a multivariable logistic regression model in which the key independent variables were the Medicaid coverage indicator variable interacted with the age indicator variable, and state and year indicators to control for time-invariant state characteristics and for state-invariant time trends. Because prior research has shown that effectiveness of smoking cessation treatments might differ by sex, we replicated this primary analysis, stratified by sex.[19] We estimated the effect of Medicaid expansion on smoking cessation, comparing low-income adults in states that expanded Medicaid coverage to those in states that did not, in the intervention group vs. the comparison group. Results are shown as average marginal effects calculated from the regression models. All analyses incorporated BRFSS survey weights to account for the complex sampling design and standard errors were adjusted to account for correlation within each state. All analyses were conducted using Stata Statistical Software: Release 14 (StataCorp, College Station, TX). Statistical significance was determined with 95 percent confidence intervals, and the average marginal effects were calculated using the “margins” suite of commands.

RESULTS

The distribution of demographic characteristics, overall and among individuals ages 18–64 in states and with and without Medicaid coverage was similar (Table 2). Low-income adults ages 18–64 years residing in states with Medicaid coverage had, on average from 2011–2015, higher insurance coverage relative to those residing in non-expansion states (61.7% (95% CI:58.3, 65.1) vs 42.5% (95% CI: 38.9, 45.9) in 2015). (Demographic characteristics for individuals age>=65 are shown in Appendix Table A1.)

Low-income adults ages 18–64 years without dependent children who were current or former smokers and resided in states with Medicaid coverage had consistently high rates of insurance coverage over time, relative to comparable adults in states without Medicaid expansion (Figure 1, Panel A). Specifically, in 2015, 80% of low-income adult current and former smokers in states with Medicaid coverage reported having health insurance coverage, compared to 55% of comparable adult current and former smokers in non-Medicaid expansion states. Likewise, low-income adults without dependent children who were current or former smokers and resided in states with Medicaid coverage also had consistently lower rates of reported barriers to care due to cost, relative to comparable adults in states without Medicaid expansion (Figure 1, Panel B). Specifically, in 2015, 25% of low-income adult current and former smokers in states with Medicaid coverage reported experiencing barriers to care due to cost, compared to 38% of comparable adult current and former smokers in

states without Medicaid coverage. This is a difference of 13 percentage-points in barriers to care.

From 2011–2015, low-income adult smokers ages 18–64 years without dependent children residing in states with no Medicaid coverage had a predicted probability of recent smoking cessation of 8.1% (95% CI: 6.6, 9.6) (Table 3). In contrast, low-income adult smokers without dependent children residing in states with Medicaid coverage had a predicted probability of smoking cessation of 6.0% (95% CI: 5.6, 6.4). This implies an average 2.1 percentage-point (95% CI: .25, 3.9) increase in the predicted probability of recent smoking cessation associated with a state's decision to expand Medicaid coverage to low-income adults without dependent children.

In contrast, we did not observe a statistically significant association between Medicaid expansion and smoking cessation among our comparison group of adults age>=65 years. There was an average −0.1 percentage point (95% CI: −2.1, 1.8) change in smoking cessation in the comparison group.

We also stratified the analysis by sex. There was no statistically significant difference in the association between Medicaid coverage and smoking cessation by sex. We observed similar estimates of the average predicted probability of smoking cessation attributable to Medicaid coverage among both females and males (1.9 and 2.2 percentage-points, respectively). (Full results from our regression model are shown in Appendix Table A2).

DISCUSSION

This study provides empirical evidence suggesting that expanding Medicaid coverage to non-elderly low-income adult smokers without dependent children led to a sizable increase in recent smoking cessation. This finding is likely explained by greater access to preventive healthcare services, including evidence-based smoking cessation services, resulting from Medicaid coverage. Previous research has shown insurance coverage to have a significant positive effect on smoking cessation rates among low-income adults.[6,7,8] Therefore, increased access to healthcare through Medicaid coverage is likely to increase the likelihood that an individual would attempt to quit smoking, both via provider counseling during routine healthcare visits, as well as with outpatient smoking cessation pharmacotherapies. Although we lack longer-term data, this sizable increase in smoking cessation might lead to significant reductions in morbidity and mortality caused by smoking, and related federal and state Medicaid expenditures.[20]

Our findings may suggest, by extension, that low-income adults, who have disproportionately high smoking rates, may be motivated to quit smoking when they engage with the health care system. We found that rates of health insurance coverage and access to care were substantially greater over time for low-income adult smokers in states with Medicaid coverage, relative to similar low-income adults in states without Medicaid coverage. This finding is consistent with prior research that shows that primary care appointment availability increased and short wait times decreased for Medicaid patients from 2012–2016.[21] Further, our findings are consistent with prior research that studied

coverage and access to care during the first two years of ACA Medicaid expansion which showed that there were significant reductions in cost-related barriers to care in 2015, the second year of ACA implementation.[22] Our results are consistent with a recent study in Northern California that showed that Medicaid enrollees were more likely to use smoking cessation treatment, relative to smokers enrolled in nonexchange commercial plans.[23] People who shop for health insurance on healthcare.gov are asked whether they smoke cigarettes. It is possible that this question might prompt adults to start contemplating smoking cessation during the Medicaid enrollment process. Further, a recent National Bureau of Economic Research working paper has shown that Medicaid-financed prescriptions for smoking cessation treatment increased by 36% in expansion states relative to states that did not expand Medicaid, which is highly consistent with our finding of increased smoking cessation associated with comprehensive Medicaid coverage.[24] Lastly, a recent study conducted using the BRFSS data set found that Medicaid expansion was associated with a small decline in smoking prevalence, though that study does not measure recent smoking cessation.[25] Because there may be differential effectiveness of smoking cessation services by sex, we stratified our analyses by sex to determine if Medicaid expansion might have had different association with smoking cessation among females and males.[26, 27, 28] However, we did not find a significant difference in the association between Medicaid coverage and recent smoking cessation by sex.

An alternative explanation for our findings is that there are unmeasured state-level confounders associated with Medicaid coverage that is causing smoking cessation. Although possible, we feel that is unlikely for several reasons. First, we provide empirical data showing that Medicaid coverage was associated in increased reported health insurance coverage and access to care. Second, we control for observed confounders such as age, sex, race, education, and relevant state policy factors that likely affect smoking cessation. Third, we note that similar increases in smoking cessation have been observed in other populations after the introduction of comprehensive benefits, so it is plausible we would observe the same increase among low-income adults after Medicaid coverage expansions.[29] Fourth, we detected no association between Medicaid coverage expansions and recent smoking cessation among a within-state comparison group of individuals ages>=65 years. This is because individuals ages >= 65 generally qualify for Medicare in all states, including the prescription drug benefit, and therefore did not experience a change in insurance coverage as a result of Medicaid expansion.

Given the current policy debate about the future of federal funding for state Medicaid programs, and particularly funding for adults without dependent children, it is crucial to quantify the effects of Medicaid coverage on access to health care and smoking cessation. It is important to note that access to coverage via the ACA is just one of the ways in which smoking cessation has seen a marked decline.[30] However, our findings suggest state Medicaid coverage for non-elderly adults without dependent children was associated with a significant increase in smoking cessation.

This study has limitations. First, we used the BRFSS data, which rely on accurate self-reporting by adult respondents. It is likely that this survey may therefore underrepresent smokers, relative to urine cotinine testing. However, we have no reason to believe that this

underrepresentation of smokers varies by state Medicaid expansion status. The BRFSS is the only population-based dataset that provides stable estimates by state to enable our study. Second, in our analysis, we used self-reported income to identify low-income adults as a study inclusion criterion. Respondents self-report their annual income, and there is likely error in the reporting of income in the data. However, we do not suspect differential error in reporting of income based on respondents' state Medicaid expansion status. Third, unfortunately, the BRFSS does not ask questions about use of smoking cessation treatments, so we were unable to measure the extent to which low-income adults who enrolled in Medicaid used specific smoking cessation treatments. That is an important area of future inquiry. Fourth, we were unable to study long-term outcomes associated with smoking, such as lung cancer or respiratory diseases, because Medicaid expansion policies have not been in effect for a long enough time period. This limits our ability to observe the long-term positive health effects that accrue after smoking cessation.

Smoking remains a leading cause of morbidity and mortality in the U.S.[1] This study suggests one health benefit of expanding Medicaid coverage to low-income adults, finding a 2.1 percentage-point increase in recent smoking cessation associated with state Medicaid coverage.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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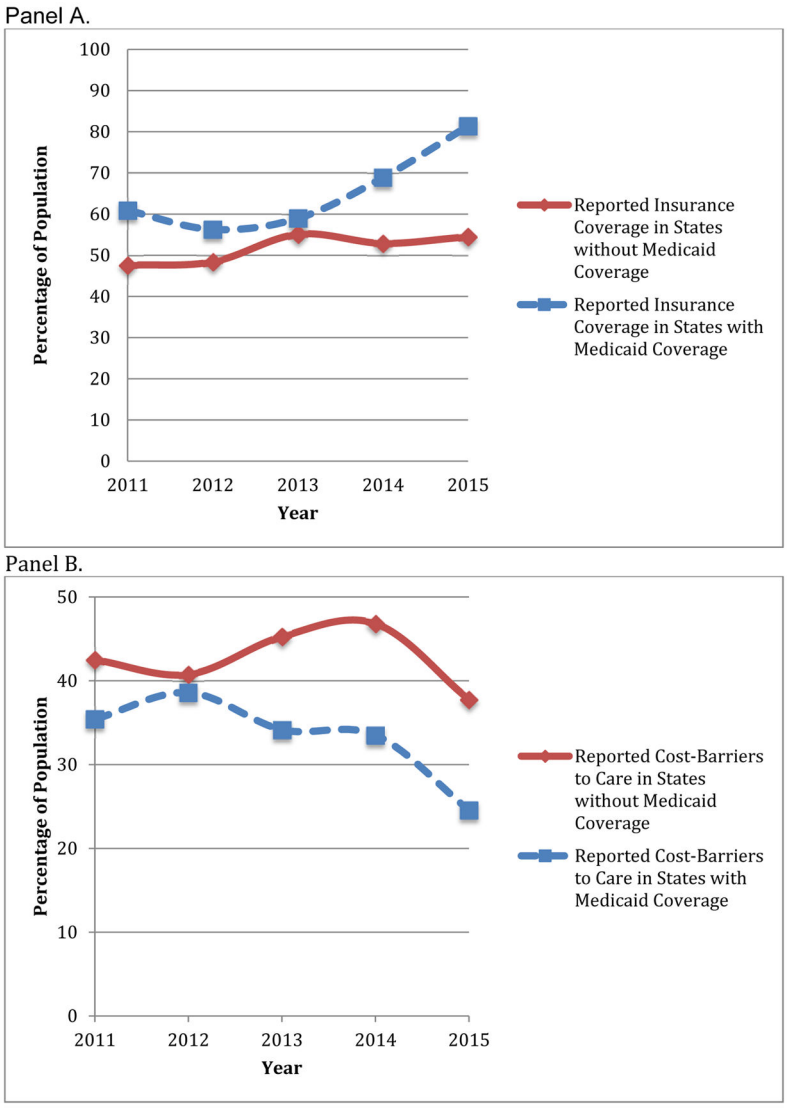

Figure 1.

Adjusted time trends of insurance coverage (Panel A) and barriers to care due to cost (Panel B) among low-income adults without dependent children who reported being smokers, by state Medicaid coverage status

Table 1

State Medicaid coverage for adults without dependent children, 2011–2015

Year Medicaid coverage adopted	States adopting new Medicaid coverage for adults without dependent children
2011 or earlier[a]	Arizona, California,[b] Connecticut, Delaware, District of Columbia, Hawaii, Maryland, Massachusetts, Minnesota, New York, New Mexico, Oregon, Vermont, Washington, Wisconsin
2012	No new states adopting
2013	No new states adopting
2014	Arkansas, Illinois, Iowa, Kentucky, Michigan, Nevada, New Hampshire,[c] New Jersey, New Mexico, North Dakota, Ohio, Rhode Island, West Virginia, Colorado
2015	Alaska,[d] Indiana, Pennsylvania
	States without Medicaid coverage for adults without dependent children
As of December 2015	Louisiana,[e] Montana,[f] Alabama, Florida, Georgia, Idaho, Kansas, Maine, Mississippi, Missouri, Nebraska, North Carolina, Oklahoma,[g] South Carolina, South Dakota, Tennessee, Texas, Utah,[g] Virginia, Wyoming

Note: State Medicaid coverage defined as comprehensive benefits provided through state Medicaid programs for adults without dependent children with incomes of up to 100% of the federal poverty level.

[a] Indiana, Iowa, Oklahoma, and Utah offered limited coverage to low-income adults, which was not counted as full Medicaid coverage.

[b] Some counties in California provided coverage to adults without dependent children prior to the 2014 Medicaid expansion

[c] New Hampshire expanded as of Aug 2014, but received approval for a waiver to use premium assistance through the marketplace plans as of Jan 2016.

[d] Alaska expanded Medicaid as of Sept 2015.

[e] Louisiana expanded Medicaid as of June 2016.

[f] Montana expanded Medicaid as of Jan 1016.

[g] Oklahoma and Utah have limited coverage for low-income adults, which is not counted as full Medicaid coverage.

Table 2

Weighted descriptive characteristics of low-income adults ages 18–64 without dependent children who reported being smokers, overall and stratified by Medicaid coverage

	Overall	Reside in state with no Medicaid Coverage	Reside in state withMedicaid Coverage[a]
Unweighted Count	25,738	10,992	14,746
Weighted Count	15,148,712	5,973,573	9,175,139
Sex			
Female	42.5%(40.8, 44.2)	41.9%(39.9, 43.9)	43.4%(40.4, 46.4)
Male	57.5%(55.8, 59.2)	56.6%(53.6, 59.6)	56.6%(53.6, 59.6)
Age group			
18–24	12.2%(11.1, 13.3)	10.8%(9.1, 12.5)	13.1%(12.2, 14.1)
25–34	15.3%(14.1, 16.5)	13.9%(11.9, 16.0)	16.2%(15.0, 17.3)
35–44	14.3%(13.5, 15.2)	14.7%(13.4, 15.9)	14.1%(12.9, 15.3)
45–54	30.5%(29.4, 31.6)	31.8%(30.0, 33.6)	29.6%(28.5, 30.9)
55–64	27.6%(26.4, 28.9)	28.8%(26.3, 31.3)	26.9%(25.6, 28.1)
Education			
Less than high school	35.6%(33.9, 37.3)	38.2%(35.1, 41.2)	33.9%(31.8, 36.1)
High school education	34.6%(33.1, 36.1)	35.1%(33.6, 36.5)	34.3%(31.9, 36.6)
More than high school	29.8%(27.9, 31.7)	26.8%(24.0, 29.5)	31.8%(29.8, 33.9)
Race/Ethnicity			
Non-Hispanic white	57.1%(51.1, 62.9)	56.9%(49.9, 63.9)	57.1%(48.1, 66.1)
Non-Hispanic black	19.3%(15.3, 23.4)	23.1%(16.4, 29.7)	16.9%(11.9, 21.8)
Other Race only, Non-Hispanic	5.4%(3.9, 6.9)	3.9%(2.5, 5.3)	6.4%(4.5, 8.3)
Multiracial, Non-Hispanic	2.3%(1.8, 2.8)	2.2%(1.6, 2.7)	2.4%(1.6, 3.1)
Hispanic ethnicity	15.9%(8.8, 22.9)	13.9%(3.7, 24.1)	17.2%(7.4, 27.0)
Marital status			
Married or member of unmarried couple	21.4%(19.9, 22.9)	23.8%(22.2, 25.4)	19.9%(18.0, 21.7)
Not married or couple[b]	78.6%(77.1, 80.0)	76.1%(74.6, 77.8)	80.1%(18.0, 21.7)
Insurance coverage[c]	54.1%(49.5, 58.7)	42.5%(38.9, 45.9)	61.7%(58.3, 65.1)

Notes: Pooled cross-sectional data from the Behavioral Risk Factor Surveillance System (BRFSS), 2011–2015. Low-income defined as <100% of the federal poverty level in each year, based on self-reported income and household size.

[a]Medicaid coverage population includes all states that have Medicaid coverage for low-income adults without dependent children in any year in our study

[b]Includes divorced, widowed, separated, never married, or refused.

[c]Indicates any insurance coverage at the time of the survey response; BRFSS did not ask about specific types of coverage prior to 2014.

Table 3

Estimated effects of Medicaid coverage on recent smoking cessation among low-income adults without dependent children who reported being smokers, 2011–2015

	Predicted probability of smoking cessation (95% CI)	
	Intervention Group:	**Comparison Group:**
Full Sample	**Age 18–64 Years**	**Age>65 years**
Reside in state with no Medicaid coverage	**6.0% (5.6, 6.4)**	3.6% (2.4, 4.8)
Reside in state with Medicaid coverage	**8.1% (6.6, 9.6)**	3.4% (2.4, 4.8)
Difference	***2.1 (0.25, 3.9)***	*−0.1 (−2.1, 1.8)*
Females		
Reside in state with no Medicaid coverage	**5.6% (4.9, 6.2)**	3.3% (2.1, 4.5)
Reside in state with Medicaid coverage	**7.5% (5.8, 9.3)**	3.1% (2.1, 4.2)
Difference	***1.9 (0.2, 3.9)***	*−0.2 (−2.3,1.9)*
Males		
Reside in state with no Medicaid coverage	**6.3% (5.6, 6.9)**	3.8% (2.5, 5.2)
Reside in state with Medicaid coverage	**8.4% (6.9, 10.0)**	3.6% (2.5, 4.8)
Difference	***2.2 (0.3, 4.0)***	*−0.2 (−1.9, 1.7)*

Note: From the BRFSS; includes 25,738 adults age 18–64 (weighted n = 15,148,712) and 10,345 adults age>65 years (weighted n = 3,344,793) with incomes <100% of the federal poverty level who reported being a current or former smoker. Smoking cessation defined as having quit smoking within the prior year, but not having smoked any cigarettes for at least one month. Average predicted probabilities are derived from logistic regression models including an interaction term between Medicaid coverage and intervention group indicator (age 18–64 years). Analyses control for sex, education, race, state, year, and state cigarette taxes and clean indoor air laws. Bold type indicates results that are statistically significant at the p<0.05 level.