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# Coverage for Adults With Chronic Disease Under the First 5 Years of the Affordable Care Act

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**Background:** A key goal of the Patient Protection and Affordable Care Act (ACA) was to increase health insurance coverage for people with chronic disease. Little is known about progress toward this goal over the first 5 years of ACA implementation.

**Objective:** The objective of this study was to assess changes in coverage for nonelderly adults with and without chronic disease over the first 5 years of ACA implementation, and the effects of state-level Medicaid eligibility expansions on coverage for these populations.

**Research Design:** Multivariable and difference-in-differences regression models.

**Participants:** A total of 2,007,271 adults aged 18–64 years in the nationally representative Behavioral Risk Factor Surveillance System 2011–2018 data.

Measures: Self-reported insurance coverage.

**Results:** Over the first 5 years of ACA implementation, coverage increased among nonelderly adults with versus without chronic disease by 6.9 versus 5.4 percentage points, respectively (95% confidence interval: 6.1–7.6, P < 0.001, and 4.4–6.3, P < 0.001, respectively). State-level Medicaid eligibility expansions were associated with a coverage increase among people with chronic disease of 2.8 percentage points (95% confidence interval: 1.7–3.8, P < 0.001). After ACA implementation di-

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Supported by the Eunice Kennedy Shriver National Institute of Child Health & Human Development of the National Institutes of Health, the Office of The Director, National Institutes of Health (OD), and the National Cancer Institute (NCI) under Award Number K12HD101368. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

The authors declare no conflict of interest.

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Supplemental Digital Content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's website, www.lww-medicalcare.com.

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ISSN: 0025-7079/20/5810-0861

minished in 2017, coverage gains for people with chronic disease declined by 0.9 percentage points (P < 0.001).

**Conclusions:** Coverage significantly improved for people with chronic disease during the first 5 years of ACA implementation, with ACA Medicaid expansions increasing coverage further. After ACA implementation diminished in 2017, coverage gains decreased.

**Key Words:** health care reform, population health, Medicaid, health policy, insurance coverage, chronic disease, Affordable Care Act

(Med Care 2020;58: 861–866)

**S** ix in 10 American adults have at least 1 chronic disease. Insurance coverage improves the management of chronic disease and decreases preventable hospitalizations. Yet, many Americans with chronic disease lack insurance coverage. Improving coverage rates among people with chronic disease remains an urgent policy concern. 10,11

A key goal of the Patient Protection and Affordable Care Act (ACA) was improving access to coverage for people with chronic disease. Multiple policies to this effect were implemented in January 2014. New policies prevented qualified health insurance plans from denying coverage or charging higher prices to people with chronic disease and mandated coverage of chronic disease care. The ACA introduced nongroup health insurance marketplaces with subsidies for low-income people and financial support for states expanding Medicaid eligibility among adults under 138% of the federal poverty line. 12,13 Due to current lawsuits, continued implementation of ACA policies is uncertain. 11,14,15

Little is known about how coverage rates evolved for people with chronic disease under the ACA. Early data show small coverage gains for people with chronic disease or with a disability after ACA implementation. <sup>16–19</sup> Medicaid contributed disproportionately to coverage gains for people with chronic disease or with a disability, suggesting the importance of Medicaid eligibility expansions for reaching this group. <sup>18,19</sup> Although informative, early studies may not capture the full effect of ACA implementation. For example, additional states elected to expand Medicaid eligibility over time, and awareness of new coverage options increased. <sup>20–22</sup>

ACA implementation also diminished in late 2017 and 2018 in ways that are particularly relevant for people with chronic disease. Government funding for ACA-related outreach, advertising, and in-person assistance declined by over 80%, and the upcoming elimination of the individual coverage mandate was announced. <sup>23–26</sup> An executive order by President Trump expanded the availability of short-term health plans that

are permitted medical underwriting (that is, permitted to charge patients with diagnosed chronic disease higher prices or deny coverage) and not required to cover chronic disease care.<sup>27</sup> Early data suggest an overall rise in the uninsured rate following these changes.<sup>28–30</sup> However, the changes in coverage rates among people with chronic diseases are unknown.

This study takes advantage of newly available national data through 2018 to address this gap in the literature. Our study objectives are to assess changes in coverage for nonelderly adults with and without chronic disease over the first 5 years of ACA implementation, and the effects of state-level Medicaid eligibility expansions on coverage for these populations.

## **METHODS**

# Study Design

We identified changes in coverage after ACA implementation, after adjusting for respondent characteristics, using multivariable regression. We stratified the data to examine trends separately for respondents with versus without self-reported chronic disease.

Coverage changes associated with Medicaid eligibility expansions were measured using a difference-in-differences strategy. We compared coverage rates for respondents in states with versus without Medicaid expansions (first difference), before and after Medicaid expansions were implemented in each state (second difference). Although expansions of Medicaid eligibility among low-income adults were intended as national policy, a 2012 Supreme Court decision made the Medicaid eligibility expansions optional. The timing of expansions by the state is in Supplemental Content Table 1 (Supplemental Digital Content 1, http://links.lww.com/MLR/C41).

#### Data and Sample

We analyzed data from the Behavioral Risk Factor Surveillance System (BRFSS) over 2011–2018. BRFSS is a repeated cross-section survey and is representative of the noninstitutionalized civilian population aged 18 years and older on the state level and national level. The median response rate per year was 47% (range: 45.2%–49.9%). We excluded 4 states (Delaware, Massachusetts, New York, and Vermont) and Washington, DC which had enacted similar Medicaid eligibility expansions before ACA implementation.<sup>31</sup>

We excluded data from the last 6 months of 2013. <sup>16</sup> Coverage purchased through the new health insurance marketplaces in late 2013 became active in January 2014, which could lead to misreporting of coverage during this period.

Our sample included adults aged 18–64 years. Participants with diagnosed chronic disease were those who responded positively to a question of the form "Has a doctor, nurse, or other health professional ever told you that you had any of the following?" Included chronic diseases were diabetes (except during pregnancy), arthritis, chronic obstructive pulmonary disease, asthma, coronary artery disease, stroke, depression, cancer (other than skin cancer), and kidney disease.

# **Statistical Analysis**

We used multivariable regression models to estimate the adjusted percentage point changes in coverage from the pre-ACA to post-ACA implementation periods overall, and stratified by self-reported chronic disease prevalence, by state, and by whether the state expanded Medicaid eligibility during 2014–2018. The independent variable of interest was a binary variable indicating 2014 and later, the post-ACA implementation period. Control variables were selected for their relevance to health insurance coverage (Supplemental Content Note 1, Supplemental Digital Content 1, http://links.lww.com/MLR/C41).

To assess changes in coverage rates over time, we interacted the postpolicy implementation indicators by the number of years of ACA implementation. We assessed whether coverage gains changed between 2017 and 2018 by testing the equivalence of the coefficients representing these 2 years.

Effects associated with Medicaid eligibility expansions were estimated using difference-in-differences models, where the independent variable was an indicator capturing implementation of the expansions in the respondent's state during the current half-year period (see Supplemental Content Table 1, Supplemental Digital Content 1, http://links.lww.com/MLR/C41, for dates of Medicaid eligibility expansions in each state). Models controlled for year indicator variables, and the other control variables noted above.

To assess the plausibility of the assumptions underlying this difference-in-differences analysis, we tested for differential trends across states with versus without Medicaid eligibility expansions before ACA implementation in 2014. In a robustness check, we used logistic regressions and calculated the percentage point changes in coverage associated with our predictors of interest using average marginal effects.

Models used heteroskedasticity robust SEs clustered on the state level, and incorporated sample weights to reflect the complex sampling scheme of the BRFSS. The University of Southern California Institutional Review Board approved the study protocol.

## **RESULTS**

The sample comprised 2,007,271 people aged 18–64 years [mean (SD) age, 40.6 (13.5) y; 55.8% women], 56.9% of whom lived in states that expanded Medicaid eligibility and 50.0% of whom reported at least 1 chronic disease. Characteristics of the sample before ACA implementation are in Supplemental Content Table 2 (Supplemental Digital Content 1, http://links.lww.com/MLR/C41).

After ACA implementation, health insurance coverage increased among nonelderly adults with versus without chronic disease by 6.9 versus 5.4 percentage points, respectively [95% confidence interval (CI): 6.1–7.6, P < 0.001, and 4.4–6.3, P < 0.001, respectively; Table 1]. Coverage gains increased with each additional year of ACA implementation for people with chronic disease by 0.3 percentage points (95% CI: 0.1–0.5, P = 0.002), but did not significantly increase over time for people without chronic disease (0.2 percentage point increase, 95% CI: –0.0 to 0.4, P = 0.093; Supplemental Content Table 3, Supplemental Digital Content 1, http://links.lww.com/MLR/C41). Statelevel gains in coverage among people with chronic disease ranged from 0.4 percentage points (Maine) to 16.1 percentage points (Arkansas) (Supplemental Content Fig. 1, Supplemental Digital Content 1, http://links.lww.com/MLR/C41).

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TABLE 1. Changes in Health Insurance Coverage for Nonelderly Adults Under ACA Implementation

				Adjusted Change in	Levels	Adjusted Difference-in-Differences	
Sample	Sample Size	Sample Pre-ACA (Mean)	Unadjusted Change	Estimate (95% CI) P		Estimate (95% CI)	P
Panel A: Respondents reporting	chronic disease						
Full sample	1,004,716	0.787	0.078* (0.071-0.085)	0.069* (0.061-0.076)	< 0.001	NA	
By Medicaid expansion status	;						
With expansion	574,949	0.812	0.088* (0.077-0.098)	0.080* (0.070-0.091)	< 0.001	0.028* (0.017-0.038)	< 0.001
Without expansion	429,767	0.753	0.065* (0.060-0.071)	0.052* (0.046-0.057)	< 0.001	Reference	
Panel B: Respondents not report	ing chronic disease						
Full sample	1,002,555	0.762	0.064* (0.055-0.074)	0.054* (0.044-0.063)	< 0.001	NA	
By Medicaid expansion status	3						
With expansion	571,430	0.786	0.070* (0.057-0.082)	0.061* (0.048-0.073)	< 0.001	0.009 (-0.002 to 0.021)	0.116
Without expansion	431,125	0.729	0.058* (0.046-0.070)	0.043* (0.033-0.053)	< 0.001	Reference	

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Data were adjusted for the control variables noted in the text; analyses incorporated Behavioral Risk Factor Surveillance System survey weights, and SEs were clustered by state.

TABLE 2. Annual Changes in Health Insurance Coverage for Nonelderly Adults Over the First 5 Years of ACA Implementation

Sample	Year 1 (2014)		Year 2 (2015)		Year 3 (2016)		Year 4 (2017)		Year 5 (2018)		Difference: 2017 vs. 2018
	Adjusted Change (95% CI)	P	P								
Respondents reporting chronic disease	0.049* (0.042–0.057)	< 0.001	0.070* (0.062–0.078)	< 0.001	0.080* (0.073–0.088)	< 0.001	0.072* (0.063–0.080)	< 0.001	0.063* (0.054–0.072)	< 0.001	< 0.001
Respondents not reporting chronic	0.040* (0.033–0.046)	< 0.001	0.057* (0.047–0.066)	< 0.001	0.062* (0.053–0.071)	< 0.001	0.054* (0.042–0.067)	< 0.001	0.049* (0.040–0.059)	< 0.001	0.107

<sup>95%</sup> CIs are in parentheses. Columns indicate the number of years of ACA implementation, and rows indicate the subsample analyzed.

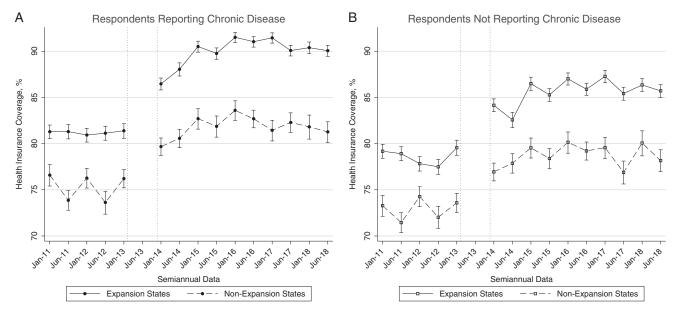
<sup>95%</sup> CIs are in parentheses. Rows and panel titles indicate the sample analyzed.

ACA indicates Patient Protection and Affordable Care Act; CI, confidence interval; NA, not available. \*P < 0.01.

Data were adjusted for the control variables noted in the text; analyses incorporated Behavioral Risk Factor Surveillance System survey weights, and SEs were clustered by state.

ACA indicates Patient Protection and Affordable Care Act; CI, confidence interval.

<sup>\*</sup>P < 0.01.



**FIGURE 1.** Unadjusted trends in insurance coverage for nonelderly adults, by chronic disease status and state-level implementation of ACA Medicaid expansions. The figure presents semiannual coverage estimates with 95% confidence intervals. The sample includes adults aged 18–64 years who report (A) or do not report (B) diagnosed chronic disease. Expansion states were those that implemented Patient Protection and Affordable Care Act Medicaid expansions between January 2014 and December 2018, and nonexpansion states were those that did not expand eligibility for Medicaid during this period. *Source*: Authors' calculation using Behavioral Risk Factor Surveillance System data from 2011 to 2018.

Coverage gains peaked in 2016 for both groups, at 8.0 percentage points for people with chronic disease and 6.2 percentage points for people without chronic disease (Table 2). Between 2017 and 2018, coverage gains declined by 0.9 percentage points among people with chronic disease (P < 0.001) but did not significantly change among people without chronic disease (0.5 percentage point decline; P = 0.107; Table 2).

Figure 1 shows semiannual trends in coverage from 2011 to 2018 in states with versus without Medicaid eligibility expansions. Coverage was relatively flat before ACA implementation but visibly increased starting in 2014, particularly in states implementing Medicaid eligibility expansions. Medicaid eligibility expansions were associated with an increase in coverage among people with chronic disease of 2.8 percentage points (95% CI: 1.7-3.8, P < 0.001), and no significant change among people without chronic disease (0.9 percentage point increase, 95% CI: -0.2 to 2.1, P = 0.116; Table 1).

We found no significant differences in trends before ACA implementation between states with versus without Medicaid eligibility expansions for people with chronic disease (-0.004, 95% CI: -0.010 to 0.002, P = 0.1822), or for people without chronic disease (-0.007, 95% CI: -0.014 to 0.001, P = 0.077). Findings remained similar when we used logistic models (Supplemental Content Tables 4, 5, Supplemental Digital Content 1, http://links.lww.com/MLR/C41).

## **DISCUSSION**

A key goal of the ACA was to improve insurance coverage among people with preexisting conditions. To assess whether this goal was met, we measured coverage rates for this group over the first 5 years of ACA implementation.

Coverage for people with diagnosed chronic disease grew with each additional year of ACA implementation by 0.3 percentage points. This finding matches prior suggestions that early evaluations may underestimate the total effects of the ACA. 31,37,38

We found a decline in coverage gains among people with chronic disease after changes to ACA implementation starting in late 2017. Several changes were enacted at this time, including an announced repeal of the penalty for lacking coverage, large cuts to government-provided funds for outreach and enrollment assistance, and an executive order expanding plans permitted medical underwriting.

Finally, Medicaid eligibility expansions increased coverage gains among people with chronic disease over 2014–2018 by 2.8 percentage points. These findings build on earlier data suggesting Medicaid contributed to initial coverage gains under the ACA for people with chronic disease or disability. These data can inform ongoing state-level policy discussions about Medicaid eligibility expansions.

The coverage changes associated with these policy changes were smaller or nonsignificant for people without chronic disease. ACA policies, including changes to permitted medical underwriting and Medicaid eligibility expansions for low-income adults, may help address barriers to insurance that are particularly salient to people with chronic disease. <sup>10,39</sup>

Our data have limitations. First, our data on insurance coverage are self-reported and lack information on duration or source of coverage. Thus, we cannot parse out how coverage gains among previously uninsured people,

including movement into Medicaid coverage, contributed to our findings. This is an important topic for continued study. Second, the self-reported BRFSS data can only capture diagnosed chronic disease. Given that access to insurance can increase diagnosis, newly diagnosed conditions may contribute to our findings. Third, states with versus without Medicaid eligibility expansions differ in important ways and we were unable to match on the substate level to improve balance. Nonetheless, the main assumption underlying a difference-in-differences design is that trends in states with versus without Medicaid eligibility expansions would have remained parallel in the absence of the expansions. We found parallel trends in coverage before 2014, suggesting the validity of our analysis.

In conclusion, coverage gains under the ACA for people with chronic disease evolved as policy implementation continued and changed. Medicaid eligibility expansions were associated with increased coverage gains, whereas nationwide changes to limit ACA implementation were associated with coverage declines. These new estimates are suggestive of the potential losses of coverage among people with chronic disease under a partial or full reversal of policy.

#### **ACKNOWLEDGMENT**

The authors thank Jiren Sun for excellent research assistance.

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