APPENDIX

Federal Poverty Level (FPL) Imputation Procedure:

Following the work of Sommers et al. (2015), we used an imputation procedure to convert the household income data contained in the Behavioral Risk Factor Surveillance System to FPL percentage. We first converted each of the survey's income categories into a dollar term using the midpoint of the category range (e.g. $30,000 for people reporting household income between $25,000 and $35,000). We then used household size and the U.S. federal poverty guidelines to convert income into a percentage of FPL.

Citation:

Sommers BD, Gunja MZ, Finegold K, Musco T. Changes in Self-Reported Insurance Coverage, Access to Care, and Health Under the Affordable Care Act. *JAMA*. 2015;314(4):366.

Regression Analyses:

As described in the main text, all regression models were estimated as linear probability models with BRFSS sampling weights. Additionally, all models were stratified to enable assessment of differential trends by household income group and state Medicaid expansion status. All vectors are bolded, while scalars are not.

We first estimated simple models to determine unadjusted changes in access:

(1) $Y_{ist} = \alpha + \boldsymbol{\beta_t} + \varepsilon_{ist}$

Where i represents individuals, s represents states, and t represents time period of the survey. $\boldsymbol{\beta_t}$ are quarterly fixed effects with separate dummy variables for each quarter 2011-2017, and ε_{ist} is the error term. With the fourth quarter of 2013 set as the reference group, the vector $\boldsymbol{\beta_t}$ reflects unadjusted changes in mean outcomes relative to the period just before the rollout of the ACA.

We then used an interrupted time series design to quantify changes in access outcomes 2013-2017, controlling for longer run trends and observed covariates. These models were of the form:

(2) $Y_{ist} = \boldsymbol{\alpha_s} \times \boldsymbol{\beta_{st}} + \boldsymbol{\gamma_{t.post}} + \boldsymbol{\delta X_{it}} + \varepsilon_{ist}$

where $\boldsymbol{\alpha_s}$ are state fixed effects, $\boldsymbol{\beta_{st}}$ are state-specific linear time trends, $\boldsymbol{X_{it}}$ is a vector of observed individual characteristics and $\boldsymbol{\gamma_{t.post}}$ are a set of indicator variables for whether the respondent was interviewed in each quarter of 2014 through 2017, after rollout of the ACA. $\boldsymbol{\gamma_{t.post}}$ are thus our regression-adjusted estimates of the changes in outcomes associated with the Affordable Care Act rollout, after controlling for observed covariates and pre-existing time trends 2011-2013.

The difference in outcomes associated with the transition from the Obama to Trump administration is the difference between $\boldsymbol{\gamma_{2016q4}}$ for the fourth quarter of 2016 and the $\boldsymbol{\gamma_{t.post}}$ for

each quarter of 2017. Wald tests were used to test whether these differences were statistically significant.

To examine changes in coverage disparities, the sample for these comparisons were limited to the high and low groups. For instance, when quantifying changes in income-based disparities respondents in the middle-income group (138% to 400% FPL) were excluded. We then interacted our interrupted time series model (2) with an indicator for the 'high' group, in this case whether the respondent's household income was >400% FPL:

$$(3) \qquad Y_{ist} = \boldsymbol{\alpha}_s + \boldsymbol{\alpha'}_s Inc400_i + \boldsymbol{\beta}_{st} + \boldsymbol{\beta'}_{st} Inc400_i + \boldsymbol{\gamma}_{t.post} + \boldsymbol{\gamma'}_{t.post} Inc400_i + \boldsymbol{\delta} X_{it} + \\ + \boldsymbol{\delta} X_{it} Inc400_i + \varepsilon_{ist}$$

where α, β, γ, and δ are main effects and α', β', γ', and δ' are coefficients on the interaction of each term with a binary indicator for household income >400% FPL. The vector $\boldsymbol{\gamma'}_{t.post}$ denotes changes in absolute disparities in outcomes between high- and low-income groups relative to the fourth quarter of 2013. The difference in disparities associated with the transition from the Obama to Trump administrations is the difference between $\boldsymbol{\gamma'}_{2016q4}$ and $\boldsymbol{\gamma'}_{t.post}$ for each quarter of 2017. Wald tests were used to test whether these differences were statistically significant.

Exhibit A1. Characteristics of the Study Sample

Variable	Expansion States		Non-Expansion States	
	Frequency	Weighted %[1]	Frequency	Weighted %[1]
Sex				
Male	576,012	49.9	363,736	49.7
Female	736,922	50.1	479,700	50.3
Marital Status				
Unmarried	566,209	47.9	338,837	46.1
Married	746,725	52.1	504,599	53.9
Children in household				
No	820,089	62.5	516,475	61.2
Yes	492,845	37.5	326,961	38.8
Age Group				
18-24	104,363	15.9	69,485	16.2
25-29	89,687	10.2	59,980	10.2
30-34	105,161	11.3	71,209	11.4
35-39	113,046	9.7	74,727	9.9
40-44	125,013	10.7	79,499	10.8
45-49	147,380	9.8	91,243	9.7
50-54	188,802	12.2	117,612	11.9
55-59	214,019	10.4	134,753	10.0
60-64	225,463	9.9	144,928	9.9
Race/Ethnicity				
White	975,271	62.3	638,820	60.8
Black	103,529	10.1	92,988	16.2
Hispanic	122,283	17.4	65,667	17.1
Other	78,746	8.6	31,999	4.5
Multiracial	33,105	1.6	13,962	1.4
Educational Attainment				
Less than high school	88,784	13.6	66,041	14.5
High school grad	343,090	27.4	236,015	28.6
Some college	359,962	31.0	248,618	32.0
College graduate	521,098	28.0	292,762	24.9
Household Income Group				
<138% FPL	382,002	35.0	273,658	37.9
138 to 400% FPL	575,800	42.2	377,761	42.0
>400% FPL	355,132	22.8	192,017	20.1
Employment Status				
Unemployed	90,529	8.3	52,844	7.9
Employed	886,937	66.3	561,200	65.8
Not in labor force	335,468	25.4	229,392	26.3
Homeownership Status				
Renter	437,847	37.8	260,919	35.3
Homeowner	875,087	62.2	582,517	64.7

SOURCE: Authors' analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS). **NOTES:** [1]Data are adjusted by BRFSS sampling weights.

Exhibit A2. Unadjusted measures of health care access, 2011-2017

Strata	Outcome	2011				2012				2013				2014			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Overall	Uninsured	20.6%	21.3%	22.5%	22.9%	21.4%	22.0%	22.2%	23.3%	21.0%	20.9%	21.5%	20.8%	18.3%	16.7%	16.3%	16.9%
Overall	No personal doctor	24.0%	25.6%	25.9%	27.2%	25.3%	26.0%	25.6%	27.5%	27.0%	27.8%	28.8%	27.7%	27.0%	26.9%	26.2%	27.0%
Overall	Avoided care	18.7%	18.8%	19.8%	20.4%	19.0%	19.2%	18.5%	20.0%	18.7%	18.5%	19.1%	17.5%	16.7%	17.1%	16.8%	15.8%
<138% FPL	Uninsured	37.1%	38.3%	39.1%	39.4%	38.3%	38.9%	39.7%	40.6%	36.4%	37.0%	36.8%	35.8%	32.5%	29.1%	27.6%	28.6%
<138% FPL	No personal doctor	35.5%	37.9%	37.1%	38.8%	36.1%	37.3%	36.6%	38.2%	36.7%	38.8%	39.4%	38.3%	36.3%	35.1%	34.4%	36.7%
<138% FPL	Avoided care	33.1%	32.1%	32.9%	33.7%	32.7%	32.5%	32.1%	33.6%	31.4%	31.4%	31.7%	30.0%	28.7%	29.2%	27.7%	26.0%
138-400% FPL	Uninsured	13.3%	13.5%	14.4%	14.6%	14.4%	14.9%	15.2%	15.3%	13.7%	12.7%	14.7%	14.0%	12.1%	11.5%	11.3%	11.4%
138-400% FPL	No personal doctor	19.0%	20.0%	20.3%	21.5%	20.8%	21.1%	21.0%	22.8%	23.0%	22.2%	24.7%	22.9%	23.3%	24.1%	23.3%	22.9%
138-400% FPL	Avoided care	12.7%	13.1%	14.2%	13.9%	13.9%	13.8%	13.2%	14.3%	13.4%	12.4%	13.6%	11.9%	11.7%	11.9%	12.2%	11.4%
>400% FPL	Uninsured	6.9%	7.6%	8.2%	7.9%	7.2%	6.6%	6.9%	8.1%	7.3%	7.1%	7.1%	7.3%	6.3%	5.8%	5.8%	6.2%
>400% FPL	No personal doctor	14.7%	15.6%	16.7%	16.5%	16.4%	15.8%	16.3%	17.2%	17.5%	18.2%	17.6%	18.1%	18.2%	18.4%	17.6%	17.3%
>400% FPL	Avoided care	6.0%	7.2%	7.1%	8.1%	6.8%	6.8%	6.1%	6.9%	6.6%	6.7%	6.9%	6.3%	6.1%	6.7%	6.3%	6.0%
Non-Expansion States	Uninsured	23.5%	26.6%	26.4%	28.4%	24.7%	24.8%	26.7%	27.4%	25.9%	24.1%	25.2%	25.5%	22.1%	21.2%	20.8%	20.7%
Non-Expansion States	No personal doctor	25.6%	29.3%	28.6%	31.8%	28.8%	28.6%	29.2%	31.2%	30.8%	30.9%	31.2%	31.1%	30.4%	31.1%	30.0%	29.8%
Non-Expansion States	Avoided care	21.2%	22.0%	22.5%	24.0%	21.0%	21.5%	21.3%	23.3%	21.8%	20.2%	21.7%	20.0%	18.8%	19.2%	19.1%	18.0%
Expansion States	Uninsured	19.1%	18.4%	19.9%	19.3%	19.6%	20.2%	19.7%	20.4%	17.6%	19.2%	19.5%	17.8%	15.7%	13.2%	13.4%	15.1%
Expansion States	No personal doctor	23.2%	23.5%	24.1%	24.2%	23.4%	24.2%	23.5%	24.8%	24.4%	26.1%	27.5%	25.4%	24.5%	23.7%	23.9%	25.6%
Expansion States	Avoided care	17.4%	17.1%	18.0%	18.1%	18.0%	17.7%	16.9%	17.8%	16.7%	17.6%	17.6%	15.9%	15.2%	15.4%	15.3%	14.7%

SOURCE: Authors' analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS). **NOTES:** All columns show unadjusted population proportions, accounting for BRFSS sampling weights.

Exhibit A2. Unadjusted measures of health care access, 2011-2017 (continued)

Strata	Outcome	2015				2016				2017			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Overall	Uninsured	14.2%	14.5%	15.7%	14.9%	13.1%	13.9%	14.8%	14.1%	13.5%	14.7%	14.6%	15.8%
Overall	No personal doctor	25.2%	25.4%	25.7%	25.6%	25.7%	25.9%	26.8%	25.9%	26.1%	26.9%	26.7%	27.2%
Overall	Avoided care	14.7%	15.5%	15.9%	14.8%	14.5%	15.4%	15.7%	14.7%	14.9%	15.9%	15.6%	15.8%
<138% FPL	Uninsured	24.5%	25.4%	27.7%	25.7%	22.9%	24.3%	25.7%	24.8%	23.2%	24.9%	24.6%	27.5%
<138% FPL	No personal doctor	33.7%	33.3%	34.3%	33.1%	33.5%	33.9%	34.5%	34.1%	32.5%	33.3%	34.1%	35.8%
<138% FPL	Avoided care	24.5%	25.8%	25.4%	24.9%	22.9%	24.9%	24.7%	23.6%	23.1%	24.7%	24.3%	24.7%
138-400% FPL	Uninsured	10.0%	10.2%	11.3%	11.3%	9.5%	10.2%	11.0%	10.5%	10.2%	11.3%	11.7%	12.0%
138-400% FPL	No personal doctor	21.8%	22.9%	23.0%	23.6%	23.3%	23.8%	24.8%	23.7%	25.1%	25.7%	25.0%	24.9%
138-400% FPL	Avoided care	11.1%	11.8%	12.9%	11.4%	12.0%	12.4%	12.9%	12.4%	12.6%	13.2%	13.4%	13.6%
>400% FPL	Uninsured	5.9%	5.9%	5.3%	5.3%	4.7%	5.4%	6.1%	5.4%	5.3%	6.1%	6.1%	6.2%
>400% FPL	No personal doctor	18.4%	17.8%	17.2%	18.0%	18.1%	18.1%	19.4%	18.5%	18.7%	20.0%	19.4%	19.1%
>400% FPL	Avoided care	6.3%	6.6%	6.9%	6.0%	6.2%	6.9%	7.8%	6.3%	7.0%	8.0%	7.6%	7.2%
Non-Expansion States	Uninsured	19.0%	18.7%	20.9%	18.8%	17.2%	19.0%	19.4%	18.4%	19.0%	19.7%	19.5%	21.7%
Non-Expansion States	No personal doctor	31.0%	29.0%	29.1%	29.0%	28.7%	30.6%	31.0%	29.4%	31.3%	30.9%	30.0%	31.5%
Non-Expansion States	Avoided care	17.5%	17.7%	18.9%	17.7%	17.8%	18.7%	18.5%	17.0%	18.4%	19.1%	18.2%	19.3%
Expansion States	Uninsured	11.3%	11.8%	12.2%	12.5%	11.0%	10.6%	11.1%	12.1%	10.2%	10.9%	11.9%	12.6%
Expansion States	No personal doctor	21.8%	23.0%	23.4%	23.5%	24.1%	22.8%	23.4%	24.3%	23.1%	23.9%	24.7%	24.8%
Expansion States	Avoided care	13.1%	14.1%	13.9%	13.1%	12.7%	13.2%	13.4%	13.6%	12.8%	13.4%	14.2%	13.8%

SOURCE: Authors' analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS). NOTES: All columns show unadjusted population proportions, accounting for BRFSS sampling weights.

Exhibit A3. Unadjusted changes from 2013-2017 in health care access by household income group and state Medicaid expansion status

Outcome	Household Income	Non-Expansion States				
		2016Q4[1]	2017Q1 vs 2016Q4[2]	2017Q2 vs 2016Q4[2]	2017Q3 vs 2016Q4[2]	2017Q4 vs 2016Q4[2]
Uninsured	<138% FPL	-11.5****	-0.3	-0.9	-1.6**	4.7****
	138-400% FPL	-3.6****	-0.2	2.1****	2.5****	2.4****
	>400% FPL	-1.0***	-1.3**	0.6	1*	0.1
	Overall	**-7.5****	**0.6**	**1.4****	**1.1***	**3.3****
No Personal Doctor	<138% FPL	-4.2****	1.2	1.8**	1.8**	5.7****
	138-400% FPL	3.0****	2.6****	1.0*	0.4	0.3
	>400% FPL	3.7****	-1.2	0.2	-1.5**	-1.7**
	Overall	**-0.4**	**1.9****	**1.5****	**0.7**	**2.1****
Avoided Care Due to Cost	<138% FPL	-6.9****	-0.4	0.4	-0.5	1.5*
	138-400% FPL	-2.1****	1.5***	2.2****	2.1****	2.2****
	>400% FPL	-0.9**	0.2	2.3****	1.1**	1.6***
	Overall	**-4.9****	**1.4****	**2.2****	**1.3****	**2.3****
		Expansion States				
Uninsured	<138% FPL	-13.5****	-4.4****	-2.0****	-0.5	0.2
	138-400% FPL	-3.7****	-0.6*	-1.0***	0.2	0.8**
	>400% FPL	-2.1****	0.4	0.2	0.3	1.0****
	Overall	**-7.3****	**-1.8****	**-1.2****	**-0.2**	**0.5****
No Personal Doctor	<138% FPL	-2.5****	-4.2****	-4.0****	-1.4**	-1.1*
	138-400% FPL	2.0****	0.3	1.7****	1.5****	1.5****
	>400% FPL	1.2****	0.8	1.5***	1.7****	1.5***
	Overall	**-0.2**	**-1.2****	**-0.4**	**0.4**	**0.5**
Avoided Care Due to Cost	<138% FPL	-9.1****	-1.9***	-0.5	0.6	0.1
	138-400% FPL	-0.5**	-0.5	-0.4	0.4	0.6*
	>400% FPL	-0.2	0.9***	1.2****	1.4****	0.5*
	Overall	**-3.9****	**-0.8***	**-0.2**	**0.6**	**0.2**

SOURCE: Authors' analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS). **NOTES:** The exhibit displays percentage point changes for respondents reporting they are uninsured, do not have a personal doctor, or avoided care due to cost. [1]Counterfactual estimate of changes from the final quarter of 2013. [2]Wald test for the difference between two regression coefficients. * p < .1, ** p< .05, *** p < .01, **** p <.001.

Exhibit A4. Adjusted annual changes from 2013-2017 in health care access by household income group

Outcome	Household Income	2016[1]	2017 vs. 2016[2]
Uninsured	<138% FPL	-10.6****	1.3****
	138-400% FPL	-5.0****	0.9****
	>400% FPL	-1.4****	0.9****
	Overall	**-7.0****	**0.9****
No Personal Doctor	<138% FPL	-6.2****	-0.6**
	138-400% FPL	-4.5****	-0.3
	>400% FPL	-1.9****	0.2
	Overall	**-5.0****	**-0.3***
Avoided Care Due to Cost	<138% FPL	-5.1****	0.9****
	138-400% FPL	-0.4*	1.0****
	>400% FPL	0.6***	0.9****
	Overall	**-2.6****	**0.8****

SOURCE: Authors' analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS). **NOTES:** The exhibit displays percentage point changes for respondents reporting they are uninsured, do not have a personal doctor, or avoided care due to cost. [1]Counterfactual estimate of changes from the final quarter of 2013. Models are adjusted for state-level time trends, survey quarter, and respondent demographics including race, household income, sex, home ownership, educational attainment, age, veteran status, household size, and whether children were present in the household. [2]Wald test for the difference between two regression coefficients. * p < .1, ** p< .05, *** p < .01, **** p <.001.

Exhibit A5. Adjusted annual changes from 2013-2017 in health care access by household income group and state Medicaid expansion status

Outcome	Household Income	Non-Expansion States	
		2016[1]	2017 vs 2016[2]
Uninsured	<138% FPL	-7.7****	2.0****
	138-400% FPL	-4.9****	1.7****
	>400% FPL	-1.6****	1.0****
	Overall	**-6.1****	**1.6****
No Personal Doctor	<138% FPL	-4.1****	0.3
	138-400% FPL	-4.3****	-0.4
	>400% FPL	-0.9	-1.0***
	Overall	**-4.0****	**-0.3**
Avoided Care Due to Cost	<138% FPL	-1.5**	1.3****
	138-400% FPL	-0.1	1.6****
	>400% FPL	0.4	0.3
	Overall	**-1.2****	**1.2****
		Expansion States	
Uninsured	<138% FPL	-12.4****	0.9***
	138-400% FPL	-5.0****	0.4**
	>400% FPL	-1.3****	0.9****
	Overall	**-7.4****	**0.5****
No Personal Doctor	<138% FPL	-7.4****	-1.2****
	138-400% FPL	-4.5****	-0.2
	>400% FPL	-2.4****	0.9****
	Overall	**-5.5****	**-0.4**
Avoided Care Due to Cost	<138% FPL	-7.4****	0.6**
	138-400% FPL	-0.6**	0.7****
	>400% FPL	0.8***	1.1****
	Overall	**-3.3****	**0.6****

SOURCE: Authors' analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS). **NOTES:** The exhibit displays percentage point changes for respondents reporting they are uninsured, do not have a personal doctor, or avoided care due to cost. [1]Counterfactual estimate of changes from the final quarter of 2013. Models are adjusted for state-level time trends, survey quarter, and respondent demographics including race, household income, sex, home ownership, educational attainment, age, veteran status, household size, and whether children were present in the household. [2]Wald test for the difference between two regression coefficients. * p < .1, ** p< .05, *** p < .01, **** p <.001.