Supplemental Appendix for "Medicaid Expansion in Maine Significantly Reduced Uncompensated Care Costs during the COVID-19 Pandemic"

by Jordan H. Rhodes

HOSPITAL COST REPORT DATA

This study relies on hospital cost report data from 2011 to 2021 to assess the impact of Medicaid expansion in Maine on hospitals' uncompensated care costs. Extensive data-cleaning techniques that have been developed and employed in prior studies were applied towards the study sample to account for data inconsistencies (Buchmueller et al. 2019; Rhodes et al. 2020, 2023a, 2023b). These data-cleaning efforts included aggregating uncompensated care costs in instances where a hospital submitted multiple (nonoverlapping) cost reports within the same fiscal year; removing missing and negative uncompensated care cost submissions; and scrutinizing geographic fields, including hospitals' state and county submissions. Instances in which a hospital reported a missing entry for charity care costs or bad debt expenses were recoded to $0. After adjusting for missing charity care costs and bad debt expenses, there are 18 instances (all corresponding to hospitals in nonexpansion states) in which the sum of charity care costs and bad debt expenses does not equate to the hospital's total uncompensated care costs. Excluding these hospital-year observations from the analysis has no impact on the difference-in-differences estimates. In addition, excluding from the analysis those hospital-year entries that initially included a missing value corresponding to either charity care costs or bad debt expenses has no impact on the study findings.

COVARIATE DATA

I linked to the cost report data county economic and demographic characteristics from the Bureau of Labor Statistics, the Census Bureau, and the US Department of Agriculture. Information on these data and their respective sources is presented in Exhibit A1.

To account for hospitals' exposure to the COVID-19 pandemic during the final two years of the period of analysis, I developed a novel metric that is based on the source data used to construct the "COVID-19 Pandemic Vulnerability Index" through the National Institute of Environmental Health Sciences. These data include 12 risk factors that are known to influence pandemic severity, including infection rates, population characteristics, and health and environmental factors. These risk factors are modeled into an overall county-level index, which gauges a county's relative communal exposure to the COVID-19 virus at a daily-level.

I obtained daily county-level data on COVID-19 risk factors corresponding to 2020 and 2021, and flagged instances in which a county had an overall vulnerability index that exceeded the 50th percentile. An annual vulnerability index for each county was generated by taking the ratio of the number of days that a county exceeded the 50th percentile in a year and the number of days in which the pandemic was active in the United States during that year. The denominators included 308 days corresponding to data year 2020 (February 28 through December 31) and 365 days corresponding to data year 2021. This index was linked to the cost report data at the county-year level.

LOG TRANSFORMED DEPENDENT VARIABLE

The outcome of interest in this analysis is a hospital's uncompensated care costs. I converted uncompensated care costs into 2021 dollars across all sample years to account for inflation. Given the skewness of this outcome, I conducted a Box Cox transformation and log transformed uncompensated care costs to serve as the primary outcome in the regression analysis (theta = 0.07) (Deb and Norton 2017).

Prior studies that examine the impact of Medicaid expansion on hospitals' uncompensated care costs have generally focused on a dependent variable that is constructed as the ratio of uncompensated care costs to operating expenses. This outcome is useful to both account for variation in hospital size and skewness in uncompensated care costs. I focused the analysis on log transformed uncompensated care costs, rather than uncompensated care costs scaled by operating expenses, given the growing body of evidence of the impact of the COVID-19 pandemic on hospitals' operating expenses, especially following the onset of the pandemic in 2020. Several recent studies find that hospitals' operating expenses grew substantially during the pandemic, for reasons not directly tied to communal exposure to COVID-19, including increased administrative expenses and labor shortages (Rhodes et al. 2023a, 2023b; Wang et al. 2023). Because the post-expansion period in this study overlaps substantially with the onset of the pandemic, scaling uncompensated care costs by operating expenses may conflate the findings. For example, scaling by operating expenses may falsely indicate a reduction in levels of uncompensated care costs across hospitals that experienced a significant increase in operating expenses, for reasons unrelated to patient volume or care, and thus, unrelated to changes in uncompensated care costs. Panel B of Table 3 in the article represents the only instance in which uncompensated care costs are scaled by operating expenses and is intended to serve as a basis of comparison for the unadjusted (Panel A) analysis.

DIFFERENCE-IN-DIFFERENCES MODEL

I employ a difference-in-differences methodology to account for what uncompensated care costs across Maine hospitals would have been in the absence of Medicaid expansion in 2019. I rely on the experiences of 12 nonexpansion states to serve as a "control group" during the period of analysis. The list of nonexpansion states included in the difference-in-differences framework is presented in Exhibit A2.

In the baseline model, I define the pre-expansion period as fiscal years ending in 2011 through 2018, and the post-expansion period as fiscal years ending in 2019 through 2021. In addition to the baseline model, I estimate a difference-in-differences regression model that accounts for hospitals' fiscal year exposure to the post-expansion period. Because hospital fiscal years are nonuniform and do not align with the onset of Medicaid expansion in Maine, hospital submissions corresponding to fiscal year 2019 generally capture both the pre- and post-expansion periods. For example, a hospital with a fiscal year that spans October 1, 2018, through September 30, 2019, is exposed to roughly three months of the pre-expansion period and nine months of the post-expansion period. To account for partial exposure to the post-expansion period, I created an exposure field that has a value of zero when a hospital's fiscal year ends before January 10, 2019; a value between zero and one when a hospital's fiscal year overlaps with January 10, 2019, depending on the share of the fiscal year that overlaps with the post-expansion period; and a value of one when a hospital's fiscal year begins after January 10, 2019. This "dose response" approach to accounting for partial exposure across varying hospital fiscal years has also been applied in several related studies (Blavin 2016; Callison et al. 2021; Rhodes et al. 2020).

I estimate the following difference-in-differences specification to identify the causal impact of Medicaid expansion in Maine on uncompensated care costs across Maine hospitals:

$$(1)\ \ln\left(Y_{h_{(c,s)}t}\right) = \alpha_h + \gamma_t + B_1 Exposure_t + B_2 \mathbf{1}(S = \text{Maine})_{h_{(s)}} * Exposure_t + X^T_{h_{(c)}t} B + \left[B_3 Year_t + B_4 \mathbf{1}(S = \text{Maine})_{h_{(s)}} * Year_t\right] + \varepsilon_{h_{(c,s)}t}$$

$Y_{h_{(c,s)}t}$ are uncompensated care costs at hospital h, located within county c and state s, during year t; α_h are hospital fixed effects that capture time-invariant hospital characteristics; γ_t are year fixed effects, which capture common shocks across all hospitals within the same year; $\mathbf{1}(\text{S = Maine})_{h_{(s)}}$ is an indicator for hospitals located within Maine; $Exposure_t$ captures the duration of the hospital's fiscal year that overlaps with the date of expansion in Maine (January 10, 2019); $X^T_{h_{(c)}t}$ is a vector of time-varying hospital and county characteristics that may be correlated with uncompensated care costs; and, $\varepsilon_{h_{(c,s)}t}$ is a random error term that allows for correlation across hospitals within the same state over time. B_2, the

coefficient of interest in the model, captures the interaction between the "treatment" and "post" fields; B_2 is the difference-in-differences estimator, and yields the causal impact of Medicaid expansion in Maine on uncompensated care costs across Maine hospitals.

In the absence of parallel trends in uncompensated care costs during the pre-expansion period, I control for differences in pre-existing trends across Maine hospitals and hospitals located in nonexpansion states through the inclusion of a continuous year field ($Year_t$) fully interacted with an indicator for Maine hospitals (see "Parallel Trends Model" below for more detail).

The underlying assumption of the difference-in-differences framework is that hospitals in nonexpansion states capture what would have occurred across Maine hospitals in the absence of Medicaid expansion. I conducted a range of statistical analyses to ensure that the results are not biased by the overlap in Maine's post-expansion period and the onset of the COVID-19 pandemic. First, I directly control for a hospital's exposure to the pandemic through the inclusion of a county COVID-19 exposure field (see "Covariate Data" above). Second, I compared estimates from difference-in-differences models that gradually incorporate time-varying hospital, county demographic, and county economic characteristics. While these fields may not directly capture the full impact of the pandemic, to the extent that they are correlated with unobservable effects tied to the pandemic, we would expect the difference-in-differences estimates to change with the inclusion of these fields in the models. The results from these analyses are presented in Exhibits A11–A14. The inclusion of these additional covariates has minimal impact on the magnitude and the precision of the estimates.

Third, I estimated an event-study model that stratified the period of analysis into individual years, as opposed to a binary pre- and post-expansion framework. The primary coefficients of interest in this model are year fields interacted with an indicator for a Maine hospital. I compared the estimate corresponding to 2019, which represents the period prior to the pandemic but after Medicaid expansion in Maine, against estimates corresponding to 2020 and 2021, which represents the period after both the onset of the pandemic and Medicaid expansion in Maine. If the estimates corresponding to these three data years are similar in magnitude, this would bolster the notion that the effect of Maine's Medicaid expansion was immediate and sustained before and after the onset of the pandemic. More detail on the event-study model and the findings that correspond to this analysis are presented in the "Event-Study Model" section that follows.

EVENT-STUDY MODEL

The event-study analysis builds off the difference-in-differences regression model. In this framework, the coefficients of interest correspond to each year of the sample period. The event-study specification takes the following form:

$$(2)\ \ln\left(Y_{h_{(c,s)}t}\right) = \alpha_h + \gamma_t + \sum_{i=2011}^{2017} B^i \mathbf{1}(t=i)_{\boldsymbol{t}} * \mathbf{1}(S=\text{Maine})_{h_{(s)}} + \sum_{j=2019}^{2021} B^j \mathbf{1}(t=j)_{\boldsymbol{t}} * \mathbf{1}(S=\text{Maine})_{h_{(s)}} + X^T_{h_{(c)}t} B + \varepsilon_{h_{(c,s)}t}$$

The event-study models include hospital fixed effects, year fixed effects, and the same set of time-varying hospital and county controls as those included in Equation 1. The primary coefficients of interest in this model are the post-expansion year fields, (indexed by *"j"*), interacted with an indicator for hospitals located in Maine. The pre-expansion year fields that are interacted with an indicator for Maine hospitals, (indexed by *"i"*), provide an additional test for the existence of parallel trends during the period leading up to expansion. The omitted year is 2018, the year prior to expansion;

all pre-expansion (*"i"*) and post-expansion (*"j"*) interacted fields are relative to the differences in uncompensated care costs between Maine hospitals and hospitals in nonexpansion states in 2018.

The results from the event-study analysis, presented in Exhibit A16, indicate that the reduction in uncompensated care costs across Maine hospitals was both immediate and sustained throughout the post-expansion period.

PARALLEL TRENDS MODEL

A critical assumption of the difference-in-differences analysis is that hospitals located in nonexpansion states capture the change in uncompensated care costs that would have occurred across Maine hospitals in the absence of Medicaid expansion. While this assumption is untestable, I conduct both visual and statistical tests to determine whether Maine hospitals and hospitals located in nonexpansion states exhibit similar trends in uncompensated care costs during the pre-expansion period. The existence of "parallel trends" bolsters the causal framework and interpretation in the difference-in-differences methodology. The statistical analysis involves estimating a regression model that includes a continuous year variable that is fully interacted with an indicator for Maine hospitals during the period 2011–2018:

$$(3)\ \ln\left(Y_{h_{(c,s)}t}\right) = \alpha_h + \gamma_t + B_1 Year_t + B_2 \mathbf{1}(S = \text{Maine})_{h_{(s)}} * Year_t + X^T_{h_{(c)}t} B + \varepsilon_{h_{(c,s)}t}$$

B_1 and B_2 are the coefficients on a continuous year field and a continuous year field interacted with an indicator for a hospital located in Maine, respectively. B_2 is the coefficient of interest in this model and captures the relative difference in trends in uncompensated care costs across Maine hospitals and nonexpansion state hospitals during the pre-expansion period.

In Exhibits A3–A10, I present estimates corresponding to Equation 3. I find no evidence of a statistical difference in the trends in uncompensated care costs across Maine hospitals and hospitals located in nonexpansion states. When stratifying by hospital characteristics, Maine's critical access hospitals exhibit increasing uncompensated care costs leading up to expansion, relative to their nonexpansion counterparts. Although this finding runs counter to the existence of parallel trends, a positive estimate on B_2 would tend to understate a reduction in uncompensated care costs across critical access hospitals in the difference-in-differences models. However, this estimate is small in magnitude and imprecise when the outcome is logged uncompensated care costs.

STANDARD ERRORS AND INFERENCE TESTS

I cluster standard errors at the state-level to allow for correlation across hospitals within the same state over time in the difference-in-differences models. Following Callison et al. (2021), I also calculate p-values from a randomization inference procedure that has been shown to capture inference more accurately in difference-in-differences models with few treated clusters (MacKinnon and Webb 2020). I compare the p-values from this randomization inference procedure against those corresponding to the regression model with state-clustered standard errors to assess the consistency in the precision of the estimates across methodologies. This methodology involves four steps:

1. Estimate the difference-in-differences model (Equation 1) and obtain the difference-in-differences estimator corresponding to Maine (B_2^{Maine}).
2. Remove from the sample all entries corresponding to Maine hospitals, and estimate Equation 1 separately for each nonexpansion state, maintaining a post-period (*"Exposure"*) that corresponds with the onset of Medicaid expansion in Maine (January 10, 2019). Obtain the 12 difference-in-differences estimators corresponding to each nonexpansion state: $B_2^{Alabama}$, $B_2^{Florida}$, etc....

3. Generate a test statistic that captures the count of the number of times in which the absolute value of the difference-in-differences estimates corresponding to nonexpansion states exceeds the absolute value of the estimate corresponding to Maine (B_2^{Maine}):

$$TS = \sum_{n=1}^{12} \mathbf{1}(|B_2^n| > |B_2^{Maine}|)$$

Where *n* indexes each of the 12 nonexpansion states.

4. Calculate the p-value based on the test statistic generated in Step 3 as follows:

$$p=(TS/12)$$

The p-value captures the percent of instances in which hospitals in nonexpansion states experienced a greater change in uncompensated care costs, relative to Maine hospitals, in the difference-in-differences framework. Because there are only 12 nonexpansion states, the minimum nonzero p-value is 8 percent (1/12).

The results from this analysis are presented in Exhibit A15. I find that the p-values from the main model, which clusters standard errors at the state-level, and those corresponding to the randomization inference procedure, all approach zero.

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SUPPLEMENTAL TABLES AND FIGURES

EXHIBIT A1: **Data Sources**

Hospital Characteristics	Source	Link	Notes
Ownership	CMS Hospital Cost Report Data[9]	Cost Reports by Fiscal Year	RPT Worksheet, Variable 2
Critical Access Hospital	CMS Hospital Cost Report Data[9]	Cost Reports by Fiscal Year	RPT Worksheet, Variable 3
Number of Beds	CMS Hospital Cost Report Data[9]	Cost Reports by Fiscal Year	Worksheet S301; Line 14; Column 2
Teaching Hospital	CMS Hospital Cost Report Data[9]	Cost Reports by Fiscal Year	Worksheet S201; Line 56; Column 1
Uncompensated Care Costs	CMS Hospital Cost Report Data[9]	Cost Reports by Fiscal Year	Worksheet S100; Line 30; Column 1
Charity Care Costs			Worksheet S100; Line 23; Column 3
Bad Debt Costs			Worksheet S100; Line 29; Column 1
Operating Expenses	CMS Hospital Cost Report Data[9]	Cost Reports by Fiscal Year	Worksheet G300; Line 4; Column 1
Fiscal Year End Month			
Hospital County Characteristics	CMS Hospital Cost Report Data[9]	Cost Reports by Fiscal Year	RPT Worksheet, Variable 7
Rural County	US Department of Agriculture[13]	2013 Rural-Urban Continuum Codes	Codes 8 and 9
Unemployment Rate	Bureau of Labor Statistics[16]	Local Area Unemployment Statistics	
Poverty Rate	Census Bureau[15]	Small Area Income and Poverty Estimates	
Median Household Income ($ thousands)	Census Bureau[15]	Small Area Income and Poverty Estimates	
Female (%)	Census Bureau[14]	Population and Housing Unit Estimates Datasets	Files: cc-est2021-all.csv and CC-EST2020-ALLDATA.csv
Ages 65 and older (%)	Census Bureau[14]	Population and Housing Unit Estimates Datasets	Files: cc-est2021-all.csv and CC-EST2020-ALLDATA.csv
Hispanic(%)	Census Bureau[14]	Population and Housing Unit Estimates Datasets	Files: cc-est2021-all.csv and CC-EST2020-ALLDATA.csv
Black (%)	Census Bureau[14]	Population and Housing Unit Estimates Datasets	Files: cc-est2021-all.csv and CC-EST2020-ALLDATA.csv
Pandemic Vulnerability Index	Pandemix Vulnerability Index Dashboard[19]	Model 11.2.1	Data Years: 2020 and 2021

EXHIBIT A2: **Expansion and Nonexpansion State Categories**

Expansion State Categories
Maine: Expanded 1/2019 with coverage retroactive 7/2018.
Nonexpansion States*: AL, FL, GA, KS, MS, NC, SC, SD, TN, TX, WI, and WY.

*Analysis includes states that had not expanded as of 12/2021. SD (7/2023) and NC (projected 10/2023) have since expanded coverage.

EXHIBIT A3: **Parallel Trends Analysis-All Hospitals-Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	-0.157 (0.202)	-0.184 (0.184)	-0.181 (0.186)	-0.0892 (0.134)	-0.0817 (0.126)
Observations	11,771	11,771	11,771	11,771	11,771
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level; ** denotes statistically significant at the 5% level; * denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.[9, 13, 14, 15, 16]

EXHIBIT A4: **Parallel Trends Analysis-All Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	-0.00560 (0.0104)	-0.00405 (0.0120)	-0.00330 (0.0121)	0.00282 (0.0163)	0.00641 (0.0153)
Observations	11,771	11,771	11,771	11,771	11,771
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level; **denotes statistically significant at the 5% level; *denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.[9, 13, 14, 15, 16]

EXHIBIT A5: **Parallel Trends Analysis-General Acute Care Hospitals-Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	-0.117 (0.270)	-0.208 (0.237)	-0.195 (0.244)	-0.0235 (0.187)	-0.0930 (0.182)
Observations	8,616	8,616	8,616	8,616	8,616
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level;** denotes statistically significant at the 5% level; * denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.9, 13, 14, 15, 16

EXHIBIT A6: **Parallel Trends Analysis-General Acute Care Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	-0.0174* (0.00930)	-0.0132 (0.0116)	-0.0113 (0.0118)	-0.00483 (0.0176)	0.000772 (0.0176)
Observations	8,616	8,616	8,616	8,616	8,616
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level;** denotes statistically significant at the 5% level;* denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.9, 13, 14, 15, 16

EXHIBIT A7: **Parallel Trends Analysis-Critical Access Hospitals-Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	0.0568** (0.0223)	0.0699*** (0.0171)	0.0684*** (0.0164)	0.0731*** (0.0183)	0.0714*** (0.0210)
Observations	3,155	3,155	3,155	3,155	3,155
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level;** denotes statistically significant at the 5% level;* denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.[9, 13, 14, 15, 16]

EXHIBIT A8: **Parallel Trends Analysis-Critical Access Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	0.0157 (0.0115)	0.0196 (0.0118)	0.0181 (0.0116)	0.0274 (0.0164)	0.0259 (0.0172)
Observations	3,155	3,155	3,155	3,155	3,155
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level;** denotes statistically significant at the 5% level;* denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.[9, 13, 14, 15, 16]

EXHIBIT A9: **Parallel Trends Analysis-Highest Baseline Uncompensated Care Hospitals-Uncompensated Care Costs($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	-0.214 (0.269)	-0.331 (0.240)	-0.334 (0.242)	-0.119 (0.131)	-0.165 (0.127)
Observations	7,128	7,128	7,128	7,128	7,128
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level;** denotes statistically significant at the 5% level; *denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.[9, 13, 14, 15, 16]

EXHIBIT A10: **Parallel Trends Analysis-Highest Baseline Uncompensated Care Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)
1(S=Maine) X Year	-0.0198** (0.00680)	-0.0209** (0.00828)	-0.0203** (0.00840)	-0.0130 (0.0107)	-0.0106 (0.0111)
Observations	7,128	7,128	7,128	7,128	7,128
Hospital Fixed Effects		X	X	X	X
Year Fixed Effects		X	X	X	X
Hospital Controls			X	X	X
County Demographic Controls				X	X
County Economic Controls					X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level;** denotes statistically significant at the 5% level;* denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, and US Department of Agriculture.9, 13, 14, 15, 16

EXHIBIT A11: **Difference-in-Differences Estimates-All Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(S=Maine) X Exposure	-0.378*** (0.0475)	-0.370*** (0.0450)	-0.369*** (0.0446)	-0.310*** (0.0528)	-0.306*** (0.0516)	-0.302*** (0.0537)	-0.340*** (0.0410)
Observations	16,076	16,076	16,076	16,076	16,076	16,076	16,076
Hospital FEs		X	X	X	X	X	X
Year FEs		X	X	X	X	X	X
Hospital Controls			X	X	X	X	X
County Demographic Controls				X	X	X	X
County Economic Controls					X	X	X
County COVID-19 Control						X	X
Pre-Existing Trends							X

Standard errors are clustered at the state level.
***denotes statistically significant at the 1% level; ** denotes statistically significant at the 5% level; *denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, US Department of Agriculture, and COVID-19 PVI Dashboard.[9,13,14,15,16,19]

EXHIBIT A12: **Difference-in-Differences Estimates-General Acute Care Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(S=Maine) X Exposure	-0.513*** (0.0424)	-0.502*** (0.0471)	-0.497*** (0.0479)	-0.432*** (0.0657)	-0.422*** (0.0668)	-0.412*** (0.0802)	-0.412*** (0.0498)
Observations	11,701	11,701	11,701	11,701	11,701	11,701	11,701
Hospital FEs		X	X	X	X	X	X
Year FEs		X	X	X	X	X	X
Hospital Controls			X	X	X	X	X
County Demographic Controls				X	X	X	X
County Economic Controls					X	X	X
County COVID-19 Control						X	X
Pre-Existing Trends							X

Standard errors are clustered at the state-level.
***denotes statistically significant at the 1% level;** denotes statistically significant at the 5% level; *denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, US Department of Agriculture, and COVID-19 PVI Dashboard.[9,13,14,15,16,19]

EXHIBIT A13: **Difference-in-Differences Estimates-Critical Access Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(S=Maine) X Exposure	-0.227*** (0.0578)	-0.216*** (0.0446)	-0.218*** (0.0402)	-0.170*** (0.0418)	-0.173*** (0.0421)	-0.176*** (0.0402)	-0.332*** (0.0619)
Observations	4,375	4,375	4,375	4,375	4,375	4,375	4,375
Hospital FEs		X	X	X	X	X	X
Year FEs		X	X	X	X	X	X
Hospital Controls			X	X	X	X	X
County Demographic Controls				X	X	X	X
County Economic Controls					X	X	X
County COVID-19 Control						X	X
Pre-Existing Trends							X

Standard errors are clustered at the state level.
***denotes statistically significant at the 1% level; **denotes statistically significant at the 5% level; *denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, US Department of Agriculture, and COVID-19 PVI Dashboard.[9,13,14,15,16,19]

EXHIBIT A14: **Difference-in-Differences Estimates-Highest Baseline Uncompensated Care Hospitals-Log of Uncompensated Care Costs ($)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(S=Maine) X Exposure	-0.335*** (0.0447)	-0.338*** (0.0478)	-0.337*** (0.0463)	-0.257*** (0.0472)	-0.253*** (0.0472)	-0.293*** (0.0474)	-0.247*** (0.0510)
Observations	9,838	9,838	9,838	9,838	9,838	9,838	9,838
Hospital FEs		X	X	X	X	X	X
Year FEs		X	X	X	X	X	X
Hospital Controls			X	X	X	X	X
County Demographic Controls				X	X	X	X
County Economic Controls					X	X	X
County COVID-19 Control						X	X
Pre-Existing Trends							X

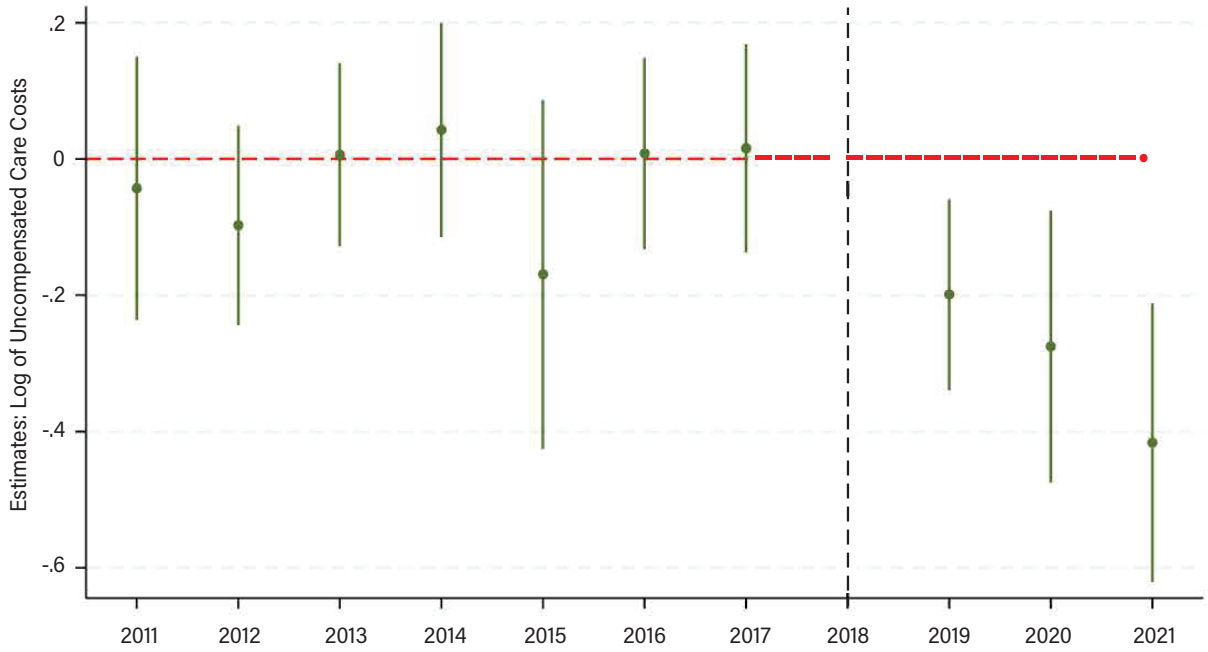
Standard errors are clustered at the state level.
***denotes statistically significant at the 1% level; **denotes statistically significant at the 5% level; *denotes statistically significant at the 10% level. Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, US Department of Agriculture, and COVID-19 PVI Dashboard.[9,13,14,15,16,19]

EXHIBIT A15: **Comparison of P-values from Inference Methodologies**

	Difference-in-Differences Estimate (Logged Outcome)
All Hospitals	
1(S=Maine) X Exposure	-0.302***
Standard Errors Clustered at the State Level P-value	0.00
Randomization Inference Procedure P-value	0.00
General Acute Care Hospitals	
1(S=Maine) X Exposure	-0.41***
Standard errors Clustered at the State Level P-value	0.00
Randomization Inference Procedure P-value	0.00
Critical Access Hospitals	
1(S=Maine) X Exposure	-0.18***
Standard Errors Clustered at the State Level P-value	0.00
Randomization Inference Procedure P-value	0.083
Highest Tercile UC Cost Hospitals	
1(S=Maine) X Exposure	-0.29***
Standard Errors Clustered at the State Level P-value	0.00
Randomization Inference Procedure P-value	0.00

Sources: CMS Hospital Cost Report Data, Census, Bureau of LaborStatistics, US Department of Agriculture, and COVID-19 PVI Dashboard.[9,13,14,15,16,19]

EXHIBIT A16: **Event-Study Estimates**



Sources: CMS Hospital Cost Report Data, Census, Bureau of Labor Statistics, U.S. Department of Agriculture, and COVID-19 PVI Dashboard.