Online Appendix for
Conditional Cash Lotteries Increase
COVID-19 Vaccination Rates

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A   Appendix tables and figures

Table A1: State COVID-19 vaccination initiatives using conditional cash lottery incentives

| Announcement date (in 2021)	State	Program name	Eligible vaccinations	Registration process	Largest prize ($)	Total prize value (approximate $)	Exclusive prizes	Drawing frequency
May 12	Ohio	Vax-A-Million	All	Opt-in	1,000,000	5,600,000	Yes	Weekly
May 20	Maryland	VaxCash	All	Auto	400,000	2,000,000	Yes	Daily
May 20	New York	Vax And Scratch	New	Opt-in	5,000,000	Unknown	No	Instant
May 21	Oregon	Take Your Shot	All	Auto	1,000,000	1,500,000	Yes	Once
May 24	Delaware	DEWins	New/All	Auto	302,000	5,000,000	Yes	Semi-weekly
May 25	Arkansas	Not named	New	Opt-in	1,000,000	2,000,000	No	Instant
May 25	Colorado	Comeback Cash	All	Auto	1,000,000	6,250,000	Yes	Weekly
May 27	California	Vax For The Win	New/All	Auto/Opt-in	1,500,000	116,500,000	Yes	Weekly
May 27	West Virginia	Do It For Babydog	All	Opt-in	1,588,000	10,000,000	Yes	Weekly
June 01	New Mexico	Vax 2 The Max	All	Opt-in	5,000,000	10,000,000	Yes	Weekly
June 03	Washington	Shot Of A Lifetime	All	Auto	1,000,000	2,400,000	Yes	Weekly
June 04	Kentucky	Shot At A Million	All	Opt-in	1,000,000	4,200,000	Yes	Monthly
June 10	North Carolina	Summer Cash	New/All	Auto	1,000,000	4,500,000	Yes	Bi-weekly
June 15	Massachusetts	VaxMillions	All	Opt-in	1,000,000	5,500,000	Yes	Weekly
June 17	Illinois	All In For The Win	All	Auto	1,000,000	10,000,000	Yes	Weekly
June 17	Louisiana	Shot At A Million	All	Opt-in	1,000,000	2,300,000	Yes	Weekly
June 17	Maine	Don't Miss Your Shot	All	Opt-in	896,809	896,809	Yes	Once
June 18	Nevada	Vax Nevada Days	All	Auto	1,000,000	5,000,000	Yes	Weekly
July 01	Michigan	Shot To Win	All	Opt-in	2,000,000	5,495,000	Yes	Bi-weekly
July 21	Missouri	MO VIP	All	Opt-in	10,000	9,000,000	Yes	Bi-weekly

Notes: Table A1 lists all state-run conditional cash lottery incentive schemes for COVID-19 vaccinations in the United States. Ohio's Vax-A-Million incentive program was the first and was announced on May 12, 2021 and lottery entry ended on June 20, 2021. The eligible vaccinations column indicates whether people who were vaccinated prior to the program's announcement could win prizes in the CCL. The registration process column indicates whether any action is required to be considered for prizes (typically filling out a form on the state's website). The total prize value column includes monetary and nonmonetary prizes, such as college tuition scholarships. The exclusive prizes column indicates whether the CCL prizes are exclusively available to vaccinated individuals, compared to non-exclusive prizes like free scratch-off tickets for state lotteries.

Table A2: State unit weights for the ridge augmented synthetic control models

State	Unit weights for model		
	Vaccinations	Cases	ICU days
Alabama	-0.065	-0.000	-0.000
Alaska	-0.021	-0.000	-0.000
Arizona	0.008	-0.000	-0.000
Connecticut	-0.058	-0.000	0.000
District of Columbia	0.009	0.000	-0.000
Florida	-0.067	-0.000	-0.000
Georgia	0.107	-0.000	0.000
Hawaii	-0.045	-0.000	-0.001
Idaho	0.181	0.000	0.000
Indiana	0.001	0.136	0.419
Iowa	-0.066	0.000	0.000
Kansas	0.281	0.304	0.082
Michigan	0.191	0.033	0.078
Minnesota	0.015	0.000	0.000
Mississippi	0.040	-0.000	-0.000
Missouri	-0.038	0.000	0.197
Montana	-0.119	-0.000	-0.000
Nebraska	0.115	0.000	0.000
New Hampshire	-0.044	0.000	-0.000
New Jersey	0.079	-0.000	0.060
North Dakota	0.126	0.000	0.000
Oklahoma	-0.007	0.000	0.000
Pennsylvania	-0.057	0.000	0.000
Rhode Island	0.024	0.109	0.165
South Carolina	0.043	-0.000	-0.000
South Dakota	-0.024	-0.000	0.000
Tennessee	0.049	0.000	0.000
Texas	-0.056	-0.000	0.000
Utah	0.091	0.141	0.000
Vermont	0.026	-0.000	-0.000
Virginia	0.031	0.000	0.000
Wisconsin	0.321	0.277	0.000
Wyoming	-0.067	-0.000	-0.000

Notes: States not listed are not in the donor pool. For outcomes in column titles:

Vaccinations = Share of population with any COVID-19 vaccination (at least a first dose).

Cases = Cumulative total COVID-19 cases recorded per 100,000 population.

ICU days = Cumulative total COVID-19 hospital ICU patient-days per 100,000 population.

Figure A1: Share of population 18-older with any COVID-19 vaccination over time
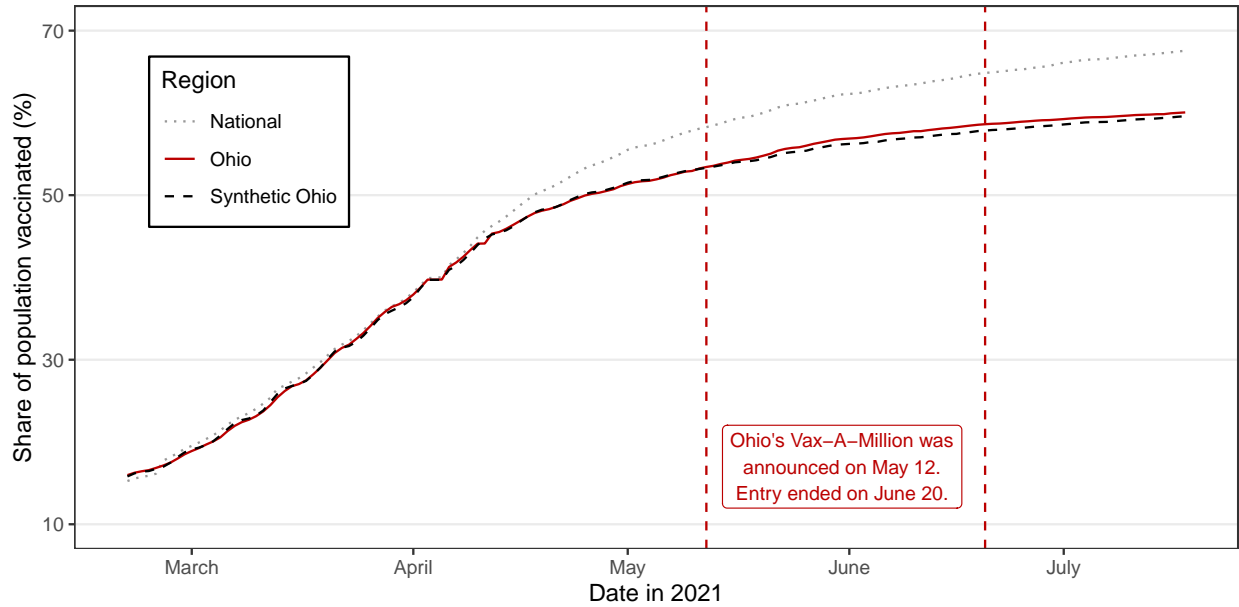

(a) Time series plotted by region
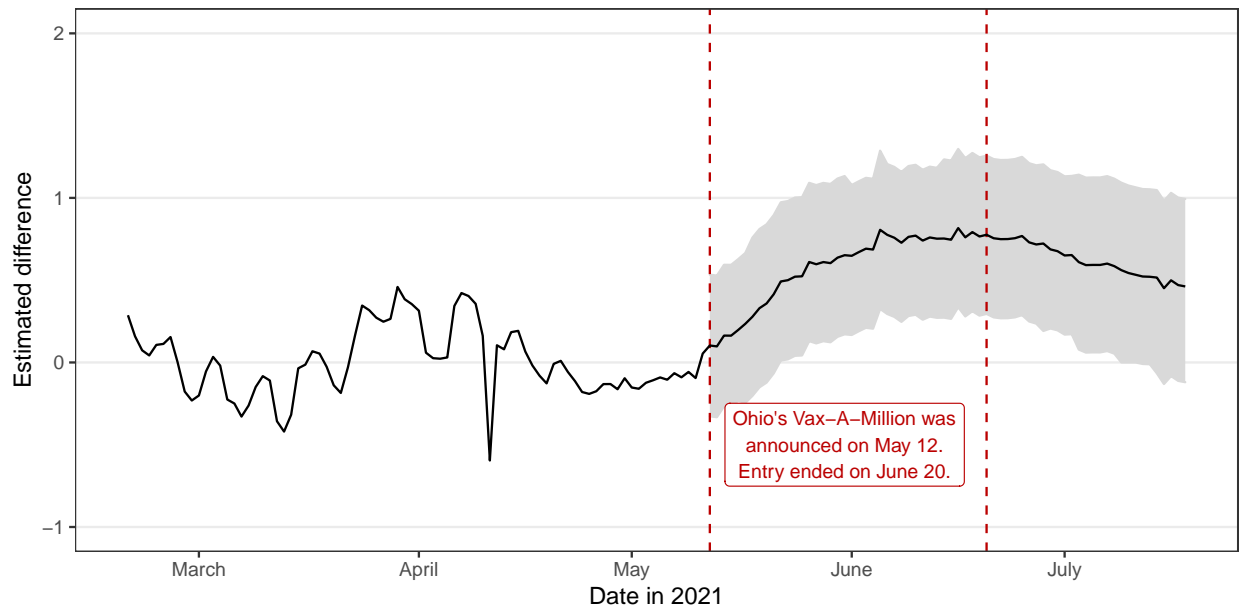
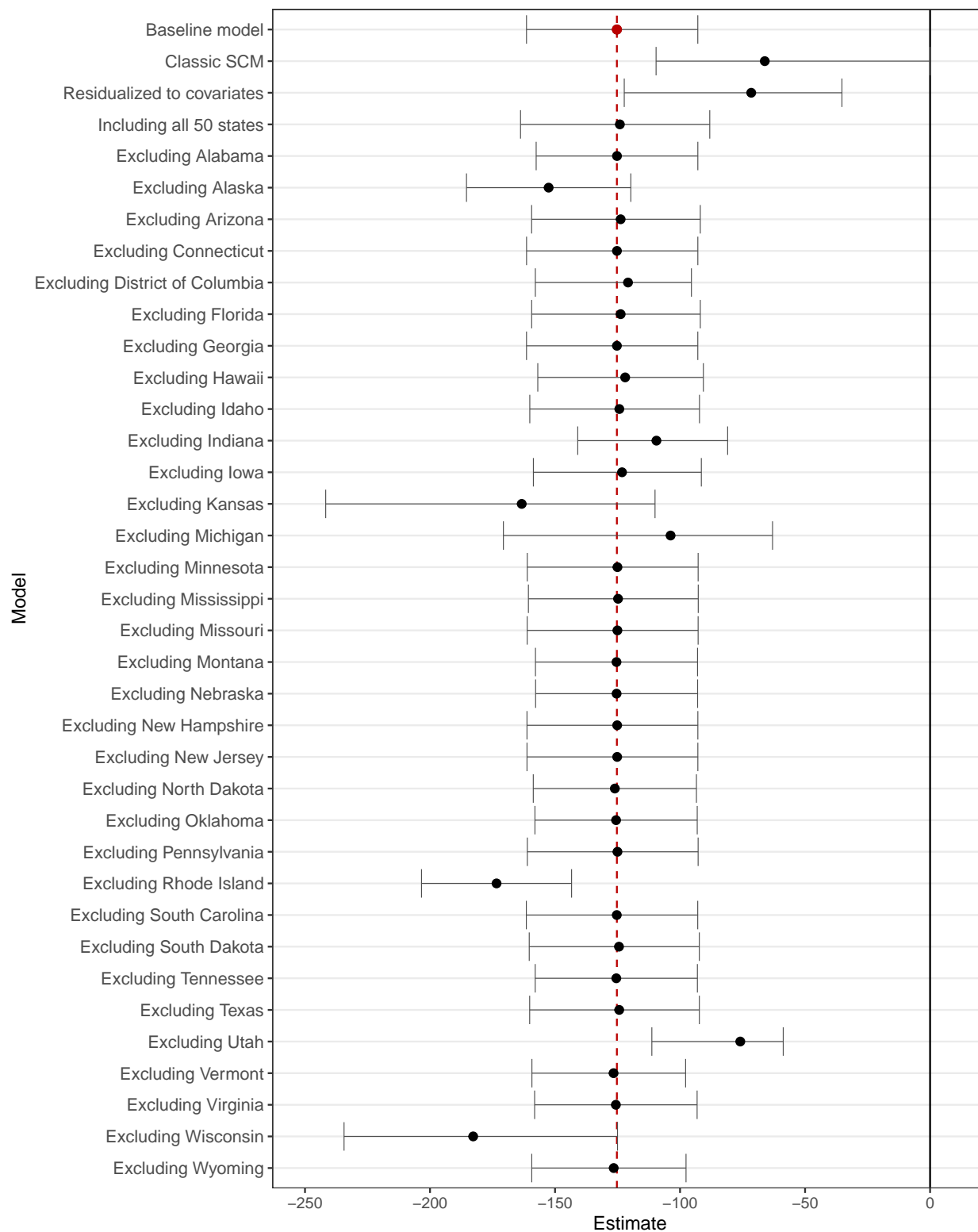(b) Estimated difference between Ohio and Synthetic Ohio

Notes: Panel (a) of Figure A1 shows time series graphs for the share of population of age 18 or older that had received at least a first dose of any COVID-19 vaccination by region and date. Panel (b) shows the estimated difference between Ohio and the synthetic control. The grey shading indicates 95 percent confidence intervals for each post-treatment date, calculated using conformal inference.

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Figure A2: Estimated effects for transformations of each outcome into a common scale
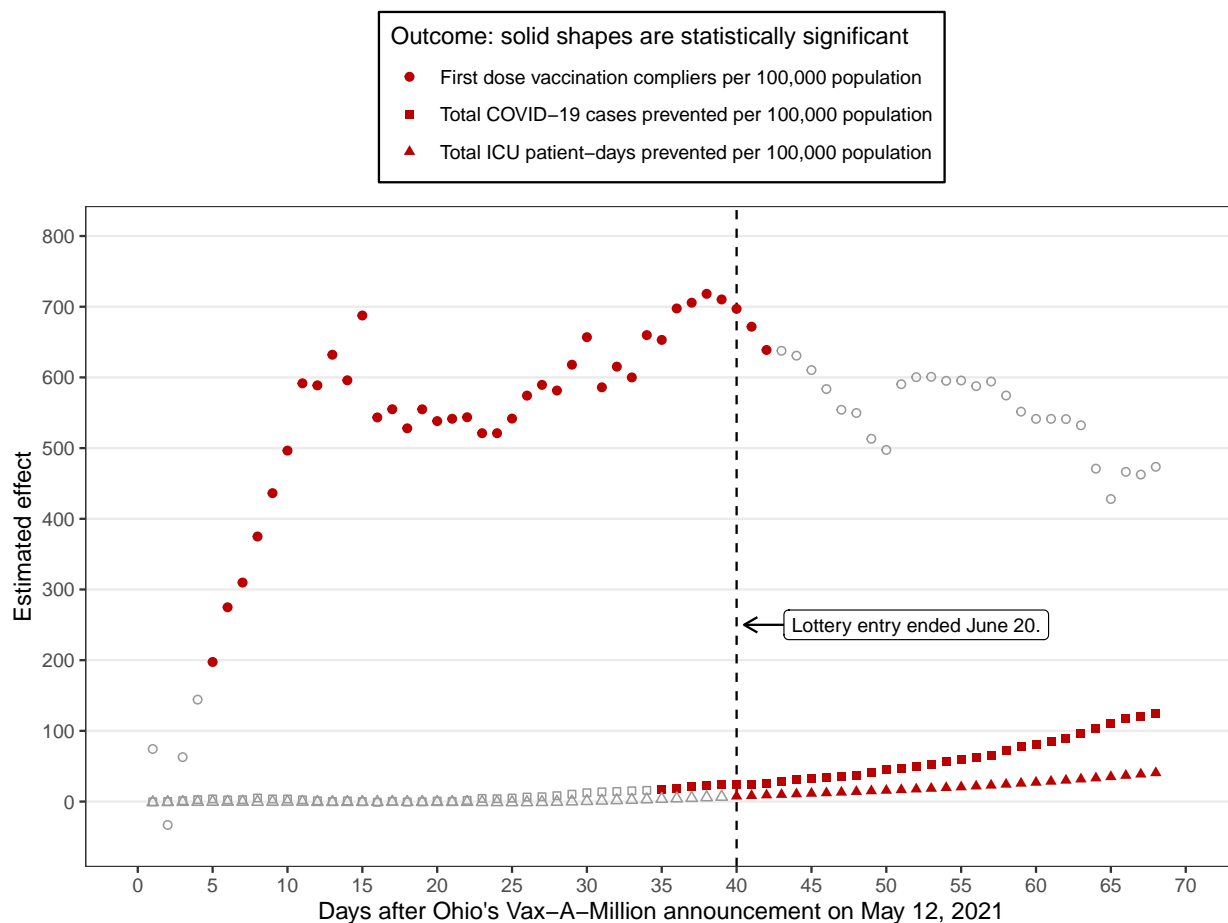
Notes: Figure A2 shows estimated differences between Ohio and the synthetic control for the three outcomes examined in this study, transformed to use a common scale. These transformations are: (1) The fraction of population with any COVID-19 vaccination – multiplied by 100,000. (2) The cumulative total COVID-19 cases recorded per 100,000 population – multiplied by negative one. (3) The cumulative total COVID-19 ICU patient-days per 100,000 population – multiplied by negative one. These effects are plotted by day following Ohio's Vax-A-Million lottery announcement. The shapes are solid if the 95 percent confidence interval does not overlap with zero, as calculated using conformal inference.

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Figure A3: Robustness checks of the synthetic control estimates for the cumulative total COVID-19 cases recorded per 100,000 population, using different samples and specifications


Notes: Figure A3 shows estimated differences between Ohio and the synthetic control for the cumulative total COVID-19 cases recorded per 100,000 population by July 18, 2021. Each row depicts results from a separate model using the data sample and/or specification denoted. The grey error bars indicate the respective 95 percent confidence intervals, which are calculated using conformal inference.

Figure A4: Robustness checks of the synthetic control estimates for the total COVID-19 ICU patient-days per 100,000 population, using different samples and specifications
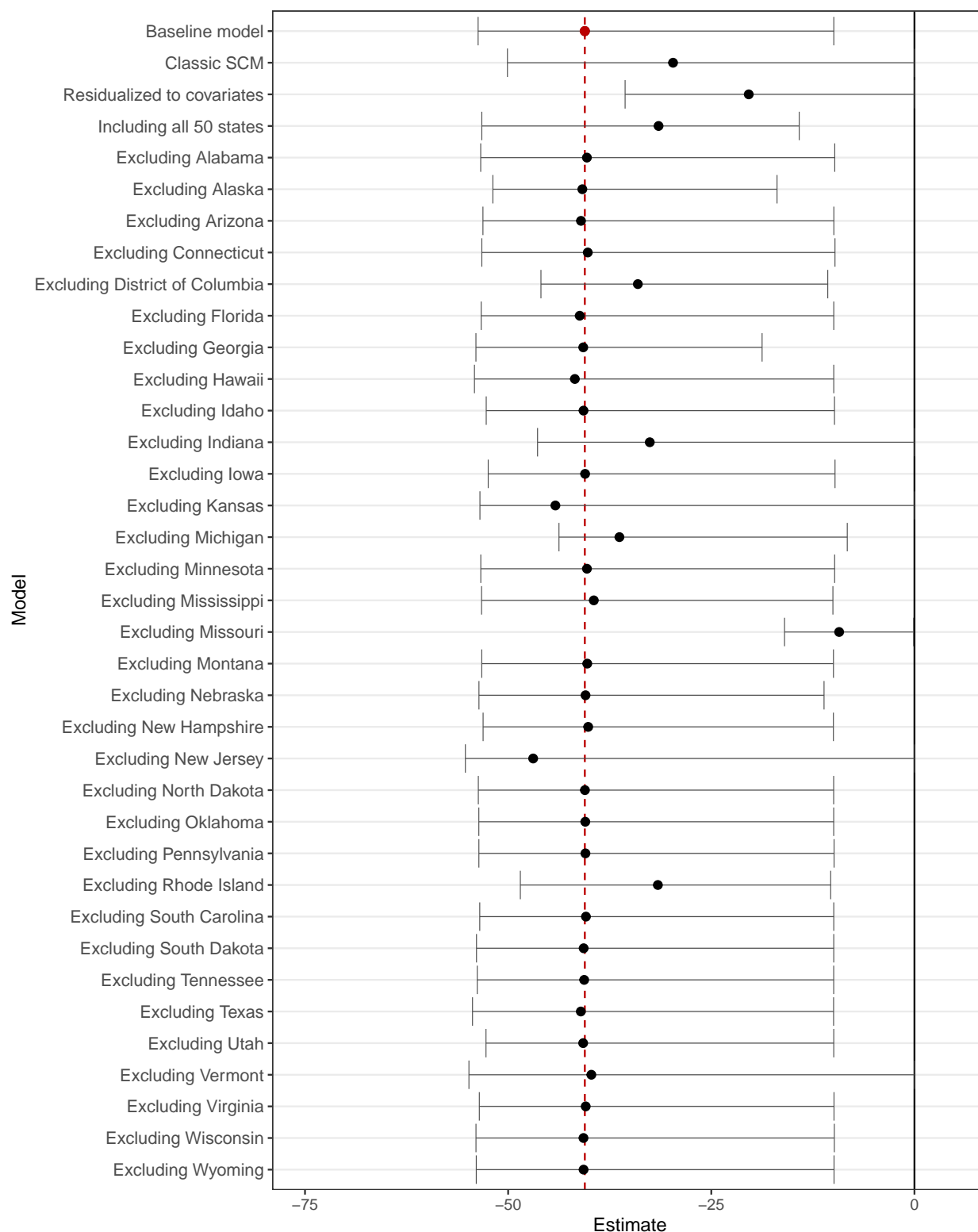

Notes: Figure A4 shows estimated differences between Ohio and the synthetic control for the cumulative total COVID-19 ICU patient-days per 100,000 population by July 18, 2021. Each row depicts results from a separate model using the data sample and/or specification denoted. The grey error bars indicate the respective 95 percent confidence intervals, which are calculated using conformal inference.

Figure A5: Synthetic control placebo effects and rankings for other states
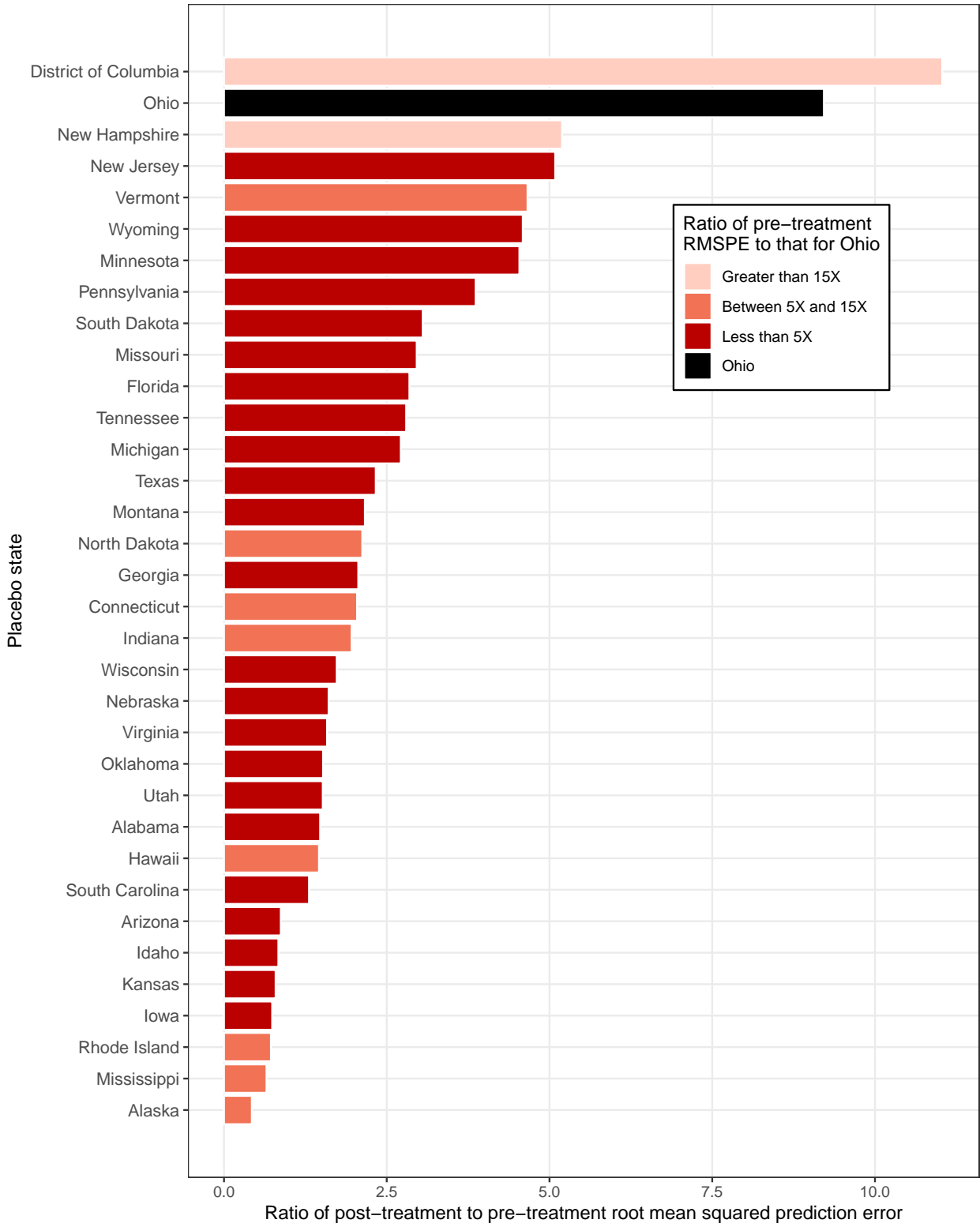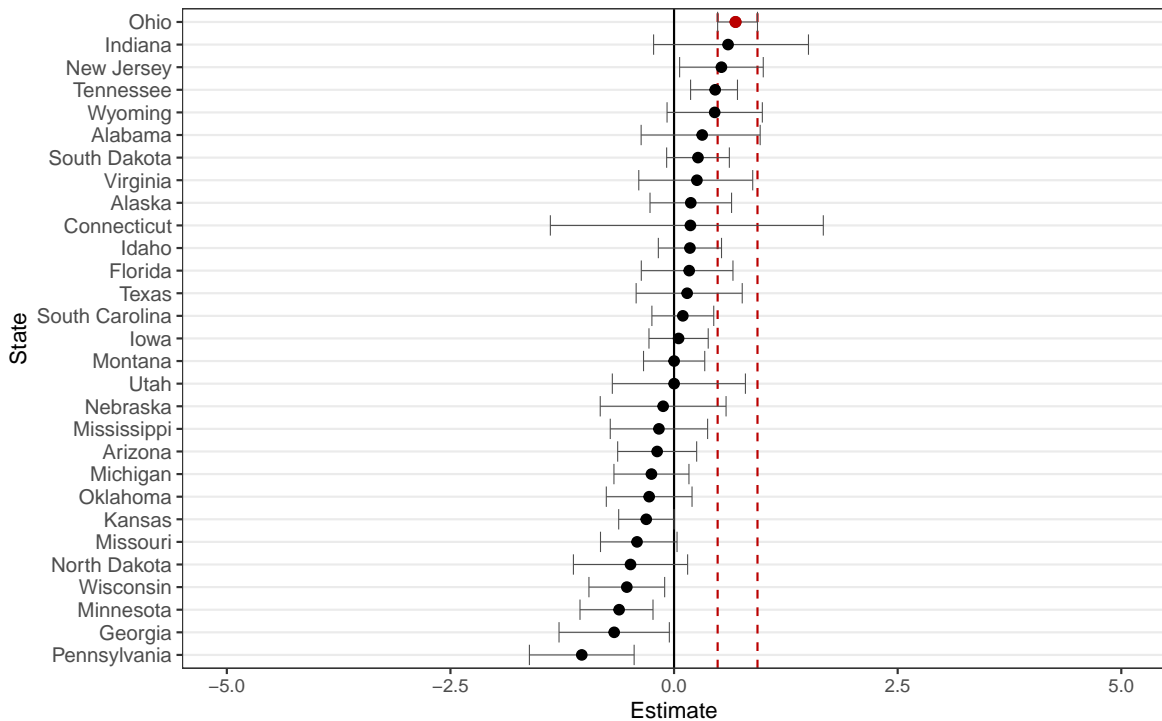
Notes: States not listed are not in the donor pool. The outcome is the share of population with any COVID-19 vaccination (at least a first dose). Post-treatment RMSPE are computed using the full treatment period, starting with Ohio's Vax-A-Million announcement on May 12, 2021 and ending with the lottery entry end-date on June 20, 2021. Pre-treatment RMSPE are computed using the full pre-treatment period in the data, starting on February 19, 2021 and ending on May 11, 2021.

Figure A6: Synthetic control placebo estimates for other states
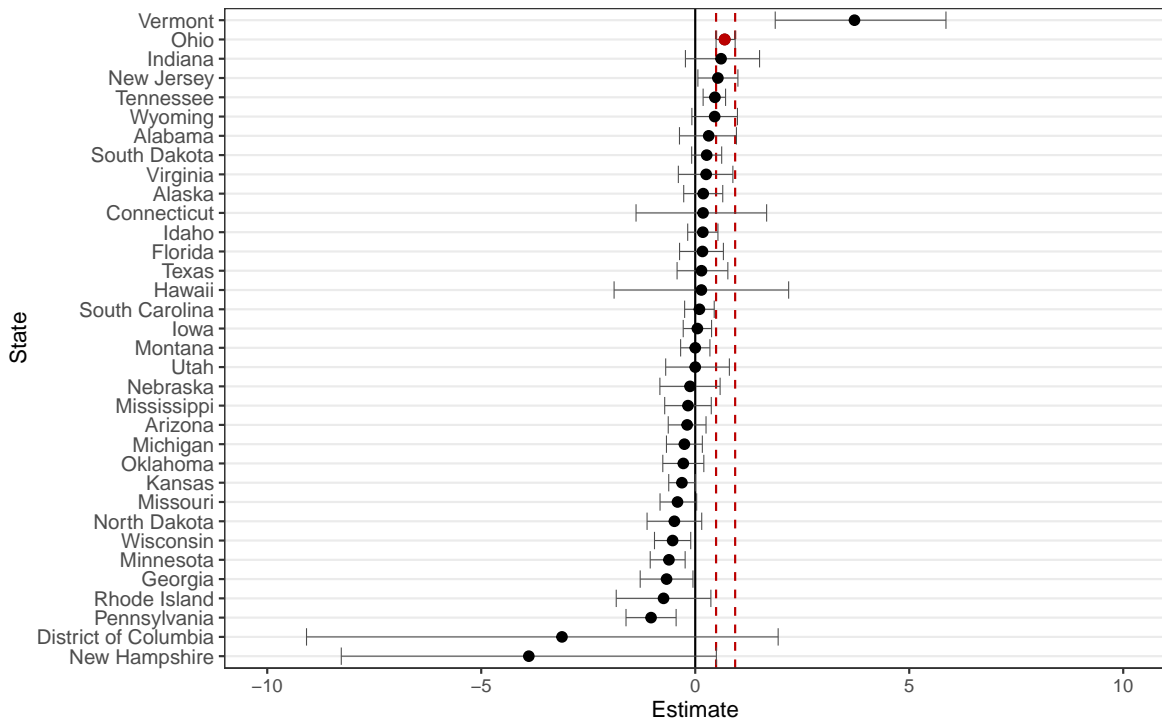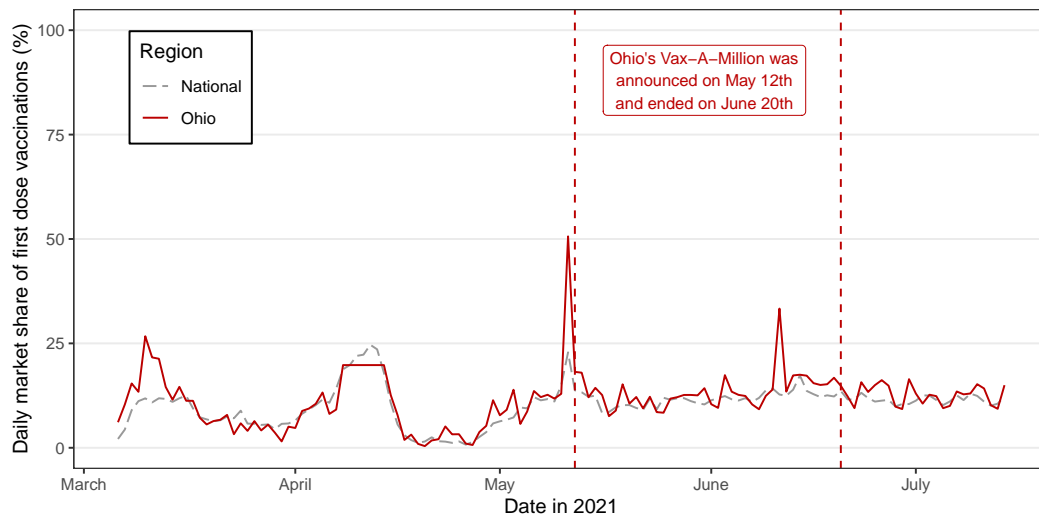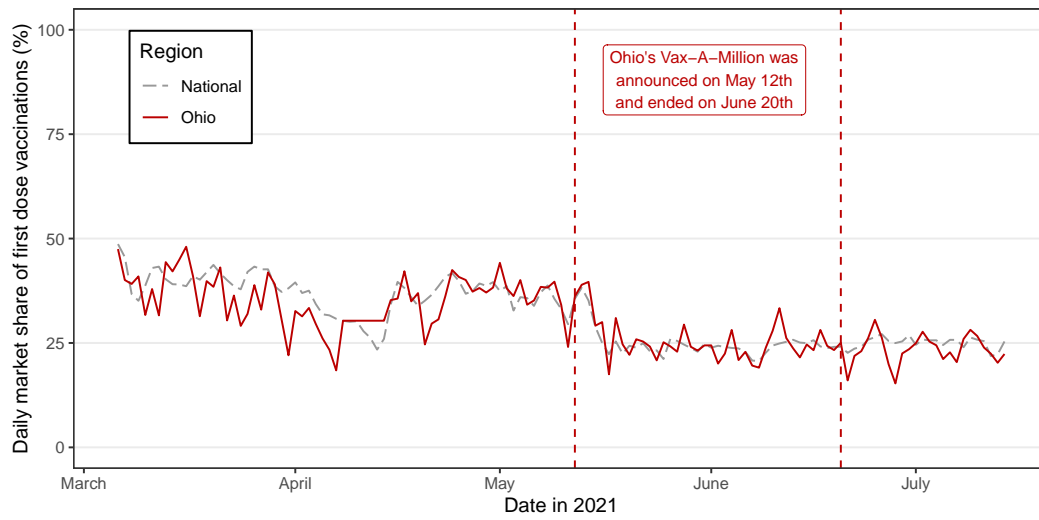

(a) Including the full donor pool

(b) Including states with pre-treatment RMSPE less than 10X that of Ohio

Notes: States not listed are not in the donor pool. The outcome is the share of population with any COVID-19 vaccination (at least a first dose) as of May 26, 2021. Pre-treatment RMSPE are computed using the full pre-treatment period in the data, starting on February 19, 2021 and ending on May 11, 2021. The grey error bars indicate the respective 95 percent confidence intervals, which are calculated using conformal inference.
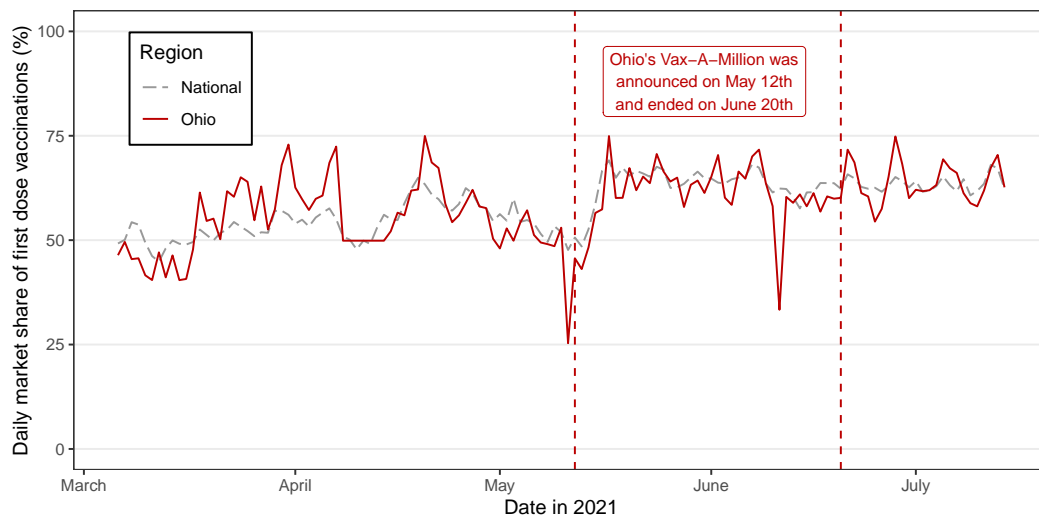
Figure A7: Manufacturers' daily market shares of first dose vaccinations over time

Ohio's Vax–A–Million was announced on May 12th and ended on June 20th

(a) Janssen

Ohio's Vax–A–Million was announced on May 12th and ended on June 20th

(b) Moderna

Ohio's Vax–A–Million was announced on May 12th and ended on June 20th

(c) Pfizer