

## SUPPLEMENTAL MATERIAL

Supplemental Table 1. Description of variables and data sources.

Variable	Description	Data Source(s)	Years	Source Link
Population	Yearly population total	Underlying Cause of Death, 1999-2019 Request, CDC WONDER	1999-2014	<a href="https://wonder.cdc.gov/ucd-icd10.html">https://wonder.cdc.gov/ucd-icd10.html</a>
Population density	Yearly population totals obtained from CDC WONDER divided by land area measurements from the 2010 Census	State Area Measurements and Internal Point Coordinates, U.S. Census Bureau	1999-2014	<a href="https://www.census.gov/geographies/reference-files/2010/geo/state-area.html">https://www.census.gov/geographies/reference-files/2010/geo/state-area.html</a>
Proportion of population MSA	Proportion of population residing within a metropolitan statistical area (MSA)	Federal Bureau of Investigation Uniform Crime Reporting Program files	1999-2014	<a href="https://ucr.fbi.gov/crime-in-the-u.s">https://ucr.fbi.gov/crime-in-the-u.s</a>
Proportion of population Black	Proportion of the state population that identify as Black	Underlying Cause of Death, 1999-2019 Request, CDC WONDER	1999-2014	<a href="https://wonder.cdc.gov/ucd-icd10.html">https://wonder.cdc.gov/ucd-icd10.html</a>
Proportion of population white	Proportion of the state population that identify as white	Underlying Cause of Death, 1999-2019 Request, CDC WONDER	1999-2014	<a href="https://wonder.cdc.gov/ucd-icd10.html">https://wonder.cdc.gov/ucd-icd10.html</a>
Unemployment rate	Number of unemployed persons divided by labor force (and multiplied by 100)	BLS Data Finder 1.1, Bureau of Labor Statistics	1999-2014	<a href="https://beta.bls.gov/dataQuery/find?q=unadjusted+unemployment&amp;q=Unemployment+Rate:%20(U)&amp;st=0&amp;r=100&amp;st=0">https://beta.bls.gov/dataQuery/find?q=unadjusted+unemployment&amp;q=Unemployment+Rate:%20(U)&amp;st=0&amp;r=100&amp;st=0</a>
Poverty rate	Percentage of the population living below the poverty line	Table 21. Number of Poor and Poverty Rate by State. Current Population Survey, U.S. Census Bureau	1999-2014	<a href="https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-people.html">https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-people.html</a>
Mean income	Per capita personal income	SAINC1 Personal Income Summary, Bureau of Economic Analysis	1999-2014	<a href="https://apps.bea.gov/itable/iTable.cfm?ReqID=70&amp;step=1">https://apps.bea.gov/itable/iTable.cfm?ReqID=70&amp;step=1</a>
Educational attainment	Percentage of population 25 years or older with high school degree (or equivalent)	Educational Attainment Tables, Current Population Survey	1999-2005	<a href="https://www.census.gov/topics/education/educational-attainment/data/tables.1999.List_2016040495.html">https://www.census.gov/topics/education/educational-attainment/data/tables.1999.List_2016040495.html</a>
		S1501 Educational Attainment and Table 233. Educational Attainment by State, American Community Survey	2006-2014	<a href="https://www2.census.gov/library/publications/2011/compendia/statab/131e4/tables/12s0233.xls">https://www2.census.gov/library/publications/2011/compendia/statab/131e4/tables/12s0233.xls</a> and <a href="https://data.census.gov/cedsci/table?q=S1501%3A%20EDUCATIONAL%20ATTAINMENT&amp;tid=ACST5Y2020.S1501">https://data.census.gov/cedsci/table?q=S1501%3A%20EDUCATIONAL%20ATTAINMENT&amp;tid=ACST5Y2020.S1501</a>
Ethanol consumption	Per capita ethanol consumption (in gallons) among statewide population	April 2021 Surveillance Report #117, National Institute on Alcohol Abuse and Alcoholism	1999-2014	<a href="https://apps.bea.gov/itable/iTable.cfm?ReqID=70&amp;step=1">https://apps.bea.gov/itable/iTable.cfm?ReqID=70&amp;step=1</a>

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Ratio of firearm-suicide to overall suicide	Firearm suicides divided by total suicides	Underlying Cause of Death, 1999-2019 Request, CDC WONDER	1999-2014	<a href="https://wonder.cdc.gov/ucd-icd10.html">https://wonder.cdc.gov/ucd-icd10.html</a>
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Outcome	Description	Data Source(s)	Years	Source Link
Handgun suicide rate (demeaned)	Handgun suicide rate (ICD-10 code X72) per 100,000 minus mean handgun suicide rate during 1999-2014 period	Underlying Cause of Death, 1999-2019 Request, CDC WONDER	1999-2019	<a href="https://wonder.cdc.gov/ucd-icd10.html">https://wonder.cdc.gov/ucd-icd10.html</a>
Firearm suicide rate (demeaned)	Firearm suicide rate (ICD-10 codes X72-74) per 100,000 minus mean firearm suicide rate during 1999-2014 period			

**SUPPLEMENTAL MATERIAL****Supplemental Table 2.** Weights of predictor variables used to construct Synthetic Wisconsin in the handgun and firearm suicide analyses.

<u>Variable</u>	<u>Handgun</u>	<u>Firearm</u>
Population	0.102	0.024
Population density	0.082	0.002
Proportion of pop. MSA	0.041	0.143
Proportion Black	0.05	0.078
Proportion white	0.058	0.031
Unemployment rate	0.086	0.056
Poverty rate	0.054	0
Mean individual income	0.119	0.261
Educational attainment	0.059	0.113
Ethanol consumption	0.145	0.055
Ratio of FS:S	0.022	0.142
2014 demeaned HSR	0.182	-
2014 demeaned FSR		0.094

Note: Firearm suicide and overall suicide are abbreviated as FS and S, respectively. Handgun suicide rate is abbreviated as HSR. Firearm suicide rate is abbreviated as FSR.

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**Supplemental Table 3.** Estimated treatment effects and placebo test results for handgun and firearm suicide analyses.

Outcome	MSPE	Donor States	Donor Weights	Treatment Effect per 100,000	Percentage Change	Post-/Pre-MSPE Placebo test
Handgun suicide	0.040	Illinois	0.210	1.14	30.3%	1/5 p = 0.2
		Iowa	0.243			
		Minnesota	0.546			
Firearm suicide	0.073	Iowa	0.280	0.45	6.5%	3/8 p = 0.375
		Minnesota	0.488			
		Rhode Island	0.232			

Notes: The percentage change corresponds to the difference between untransformed rates of Wisconsin and its synthetic control in the post-intervention period. The placebo results represent the probability of obtaining a post-/pre-repeal MSPE ratio at least as extreme as that of Wisconsin upon random assignment. All tests were restricted to the subset of donor states with pre-repeal MSPEs less than 5 times that of Wisconsin.

**SUPPLEMENTAL MATERIAL****Supplemental Table 4.** Weights of donor states comprising the original Synthetic Wisconsin for demeaned handgun suicide rates and each “leave-one-out” synthetic control.

<u>Donor State</u>	<u>Original</u>	<u>Synth 1</u>	<u>Synth 2</u>	<u>Synth 3</u>
California	0	0.222	0	0.026
Illinois	0.210	-	0.218	0.276
Iowa	0.243	0.230	-	0.698
Minnesota	0.546	0.548	0.782	-
MSPE	0.040	0.042	0.044	0.058
Effect	1.14	1.15	1.17	1.19

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**Supplemental Table 5.** Weights of donor states comprising the original Synthetic Wisconsin for demeaned firearm suicide rates and each “leave-one-out” synthetic control.

Donor State	Original	S1	S2	S3	S4	S5	S6	S7	S8
California	0	-	0	0	0	0	0	0	0.129
Hawaii	0	0	-	0	0	0	0.127	0	0.001
Illinois	0	0	0	-	0.058	0	0	0	0.030
Iowa	0.280	0.280	0.280	0.280	-	0.280	0.586	0.280	0.227
Maryland	0	0	0	0	0	-	0	0	0
Minnesota	0.488	0.488	0.488	0.488	0.721	0.488	-	0.488	0.613
New Jersey	0	0	0	0	0	0	0	-	0
Rhode Island	0.232	0.232	0.232	0.232	0.221	0.232	0.288	0.232	-
MSPE	0.073	0.073	0.073	0.073	0.089	0.073	0.106	0.073	0.101
Effect	0.45	0.45	0.45	0.45	0.65	0.45	0.36	0.45	0.55

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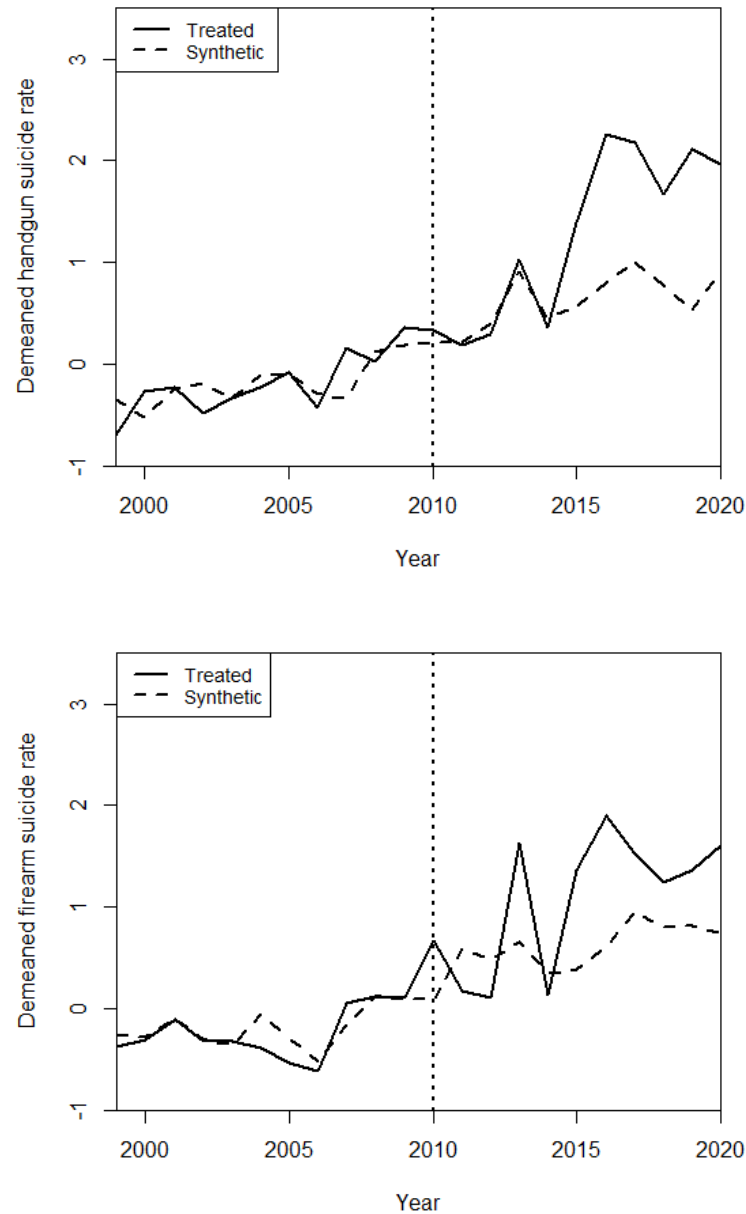
**Supplemental Table 6.** Mean pre-intervention (1999-2014) characteristics of Wisconsin, its augmented synthetic control, and the donor pool used to construct counterfactual handgun and firearm suicide trends.

Variable	Wisconsin	Synthetic WI	Sample Mean
<b><u>Handgun Suicide Analysis</u></b>			
Population	5,575,741	5,990,227	14,264,826
Population density	102.953	89.034	144.857
Proportion of pop. MSA	0.716	0.754	0.780
Proportion Black	0.066	0.068	0.078
Proportion white	0.900	0.880	0.851
Unemployment rate	5.624	5.198	5.951
Poverty rate	10.469	9.114	11.191
Mean individual income	36,407	39,991	38,989
Educational attainment	89.088	91.122	87.303
Ethanol consumption	2.375	2.016	1.879
Ratio of FS:S	0.479	0.468	0.444
<b><u>Firearm Suicide Analysis</u></b>			
Population	5,575,741	3,923,836	9,216,740
Population density	102.953	238.278	445.721
Proportion of pop. MSA	0.716	0.756	0.848
Proportion Black	0.066	0.032	0.108
Proportion white	0.900	0.919	0.750
Unemployment rate	5.624	5.388	5.864
Poverty rate	10.469	9.520	10.578
Mean individual income	36,407	38,551	40,724
Educational attainment	89.088	89.712	87.065
Ethanol consumption	2.375	2.039	1.899
Ratio of FS:S	0.479	0.428	0.375

Note: Firearm suicide and overall suicide are abbreviated as FS and S, respectively. Handgun suicide is abbreviated as HS.

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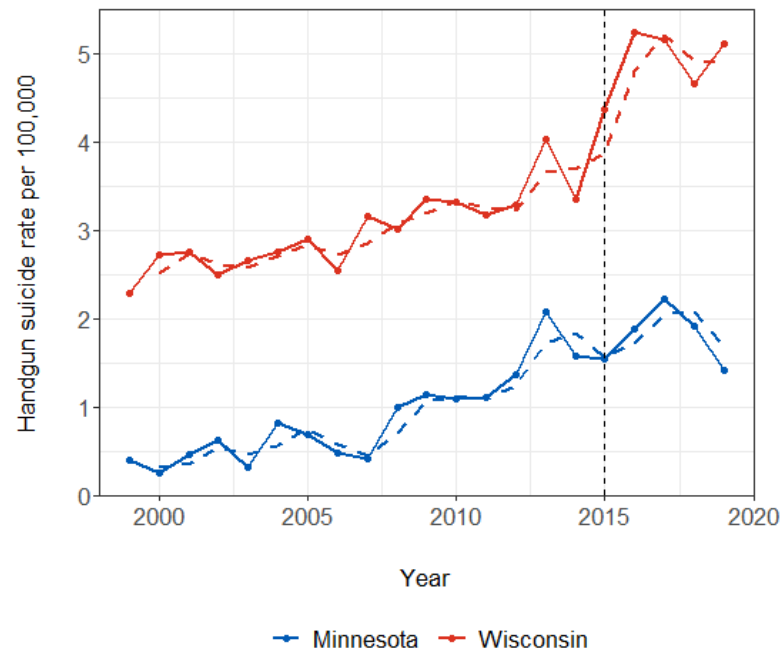
**Supplemental Figure 1.** Observed and synthetic handgun suicide (top) and firearm suicide (bottom) trends in an in-time placebo test artificially backdating the waiting period repeal to 2010.





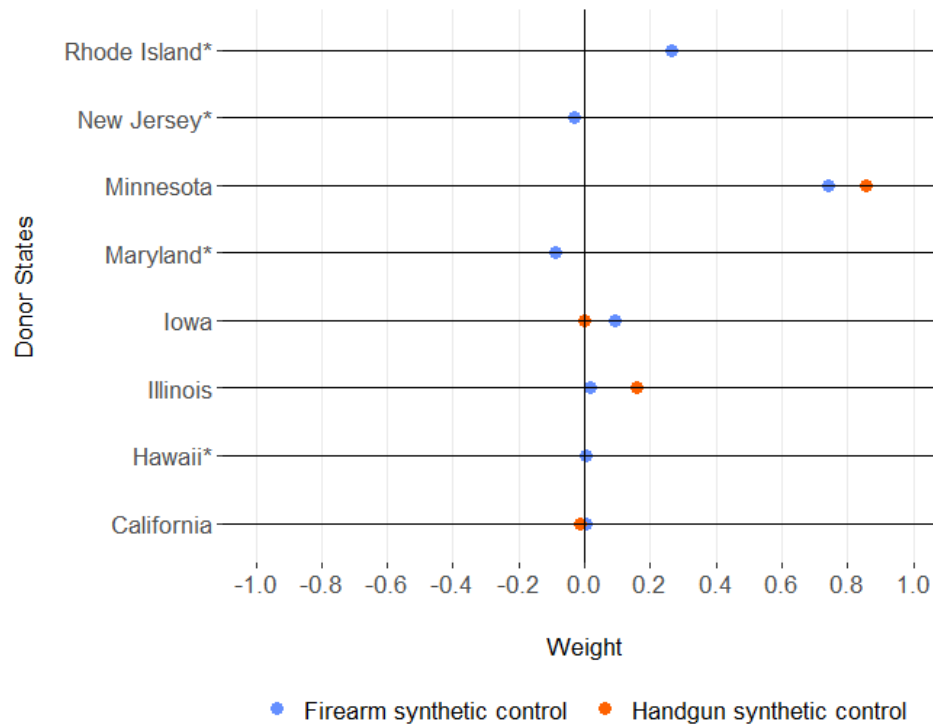
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**Supplemental Figure 2.** Rates of suicides identified as involving handguns (ICD-10 code X72) in Minnesota and Wisconsin (1999-2019). Two-year moving average rates are represented by dashed lines.



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**Supplemental Figure 3.** Donor weights for augmented synthetic controls of handgun and firearm suicide trends in Wisconsin.



Note: \* denotes donor states that were excluded from the handgun suicide analysis due to suppressed data.