

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 | https://wonder.cdc.gov/ucd-icd10.html |
| 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 | https://www.census.gov/geographies/reference-files/2010/geo/state-area.html |
| 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 | https://ucr.fbi.gov/crime-in-the-u.s |
| Proportion of population Black | Proportion of the state population that identify as Black | Underlying Cause of Death, 1999-2019 Request, CDC WONDER | 1999-2014 | https://wonder.cdc.gov/ucd-icd10.html |
| Proportion of population white | Proportion of the state population that identify as white | Underlying Cause of Death, 1999-2019 Request, CDC WONDER | 1999-2014 | https://wonder.cdc.gov/ucd-icd10.html |
| 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 | https://beta.bls.gov/dataQuery/find?q=unadjusted+unemployment&q=Unemployment+Rate:%20(U)&st=0&r=100&st=0 |
| 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 | https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-people.html |
| Mean income | Per capita personal income | SAINC1 Personal Income Summary, Bureau of Economic Analysis | 1999-2014 | https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1 |
| Educational attainment | Percentage of population 25 years or older with high school degree (or equivalent) | Educational Attainment Tables, Current Population Survey | 1999-2005 | https://www.census.gov/topics/education/educational-attainment/data/tables.1999.List_2016040495.html |
| | | S1501 Educational Attainment and Table 233. Educational Attainment by State, American Community Survey | 2006-2014 | https://www2.census.gov/library/publications/2011/compendia/statab/131e4/tables/12s0233.xls and https://data.census.gov/cedsci/table?q=S1501%3A%20EDUCATIONAL%20ATTAINMENT&tid=ACST5Y2020.S1501 |
| 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 | https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1 |

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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 | https://wonder.cdc.gov/ucd-icd10.html |
|---|--|--|-----------|---|

| 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 | https://wonder.cdc.gov/ucd-icd10.html |
| 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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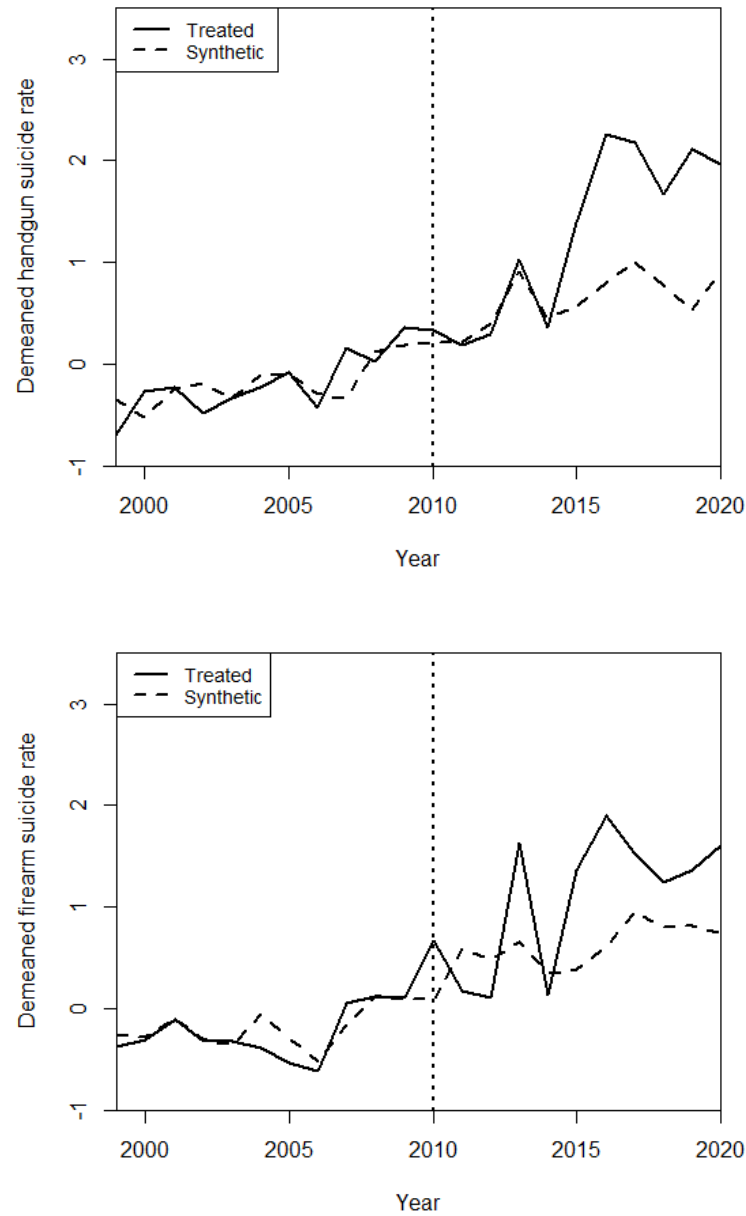
Supplemental Table 6. Mean pre-intervention (1999-2014) characteristics of Wisconsin, its augmented synthetic control, and the donor pool used to construct counterfactual handgun and firearm suicide trends.

| Variable | Wisconsin | Synthetic WI | Sample Mean |
|--|-----------|--------------|-------------|
| <u>Handgun Suicide Analysis</u> | | | |
| 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 |
| <u>Firearm Suicide Analysis</u> | | | |
| 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.

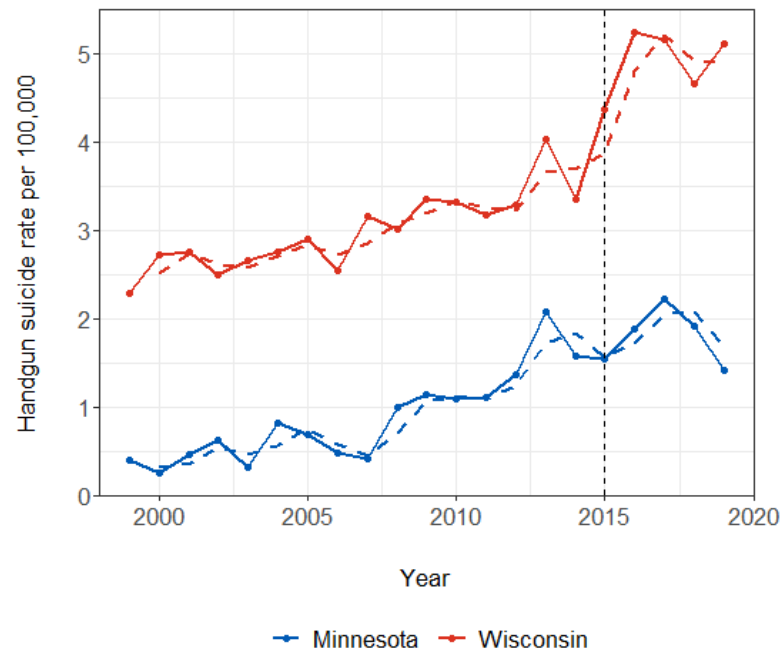
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Supplemental Figure 1. Observed and synthetic handgun suicide (top) and firearm suicide (bottom) trends in an in-time placebo test artificially backdating the waiting period repeal to 2010.



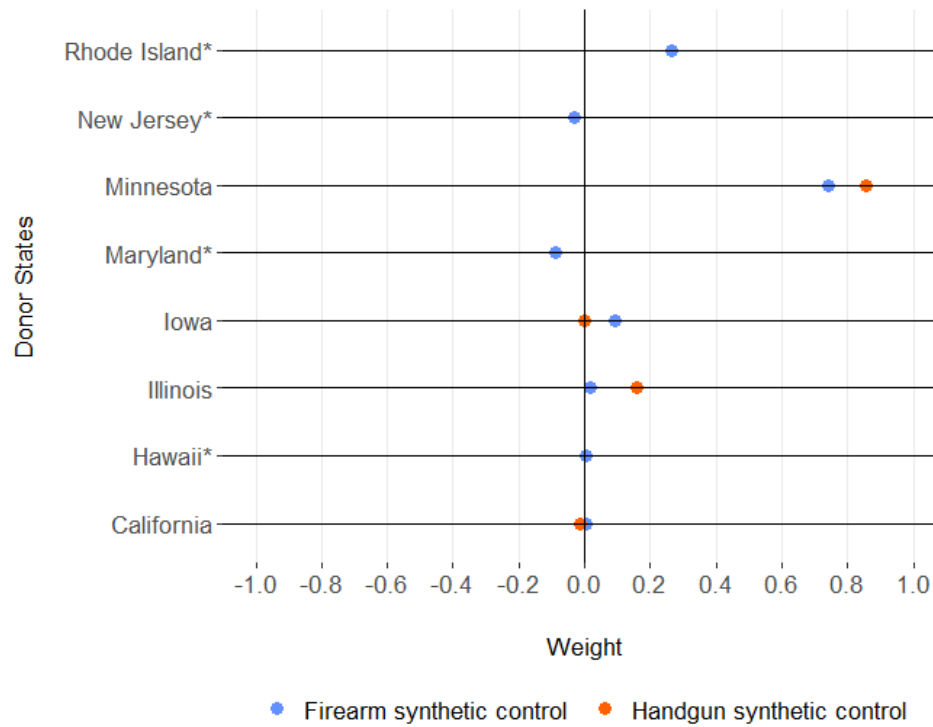
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Supplemental Figure 2. Rates of suicides identified as involving handguns (ICD-10 code X72) in Minnesota and Wisconsin (1999-2019). Two-year moving average rates are represented by dashed lines.



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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.