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ABSTRACT

Did the Wisconsin Supreme Court Restart a COVID-19 Epidemic? Evidence from a Natural Experiment*

Both the White House and state governors have explicitly linked thresholds of reduced COVID-19 case growth to the lifting of statewide shelter-in-place orders (SIPOs). This "hardwired" policy endogeneity creates empirical challenges in credibly isolating the causal effect of lifting a statewide SIPO on COVID-19-related health. To break this simultaneity problem, the current study exploits a unique natural experiment generated by a Wisconsin Supreme Court decision. On May 13, 2020, the Wisconsin Supreme Court abolished the state's "Safer at Home" order, ruling that the Wisconsin Department of Health Services unconstitutionally usurped legislative authority to review COVID-19 regulations. We capitalize on this sudden, dramatic, and largely unanticipated termination of a statewide SIPO to estimate its effect on social distancing and COVID-19 case growth. Using a synthetic control design, we find no evidence that the repeal of the state SIPO impacted social distancing, COVID-19 cases, or COVID-19-related mortality during the fortnight following enactment. Estimated effects were economically small and nowhere near statistically different from zero. We conclude that the impact of shelter-in-place orders is likely not symmetric across enactment and lifting of the orders.

JEL Classification: H75, I18

Keywords: coronavirus, COVID-19, shelter-in-place order, synthetic control

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1. Motivation

The speed and breadth with which COVID-19-related government restrictions on business operations, personal movements, and assembly rights should be lifted has sparked an intense public policy debate (Jarvie 2020, Vainshtein 2020). Proponents of lifting non-pharmaceutical interventions (NPIs) such as blanket shelter-in-place orders (SIPOs) [1], non-essential business closings, bans on large gatherings, and school closings argue that the costs of these policies — including increased unemployment (Baek et al. 2020, Couch, Fairlie and Xu 2020), decreased human capital acquisition (Doyle 2020), diminished consumption of preventative and emergency care (Lazzerini et al. 2020, Santioli et al. 2020), and poorer psychological health (Galea, Merchant and Lurie 2020, Hsing et al. 2020) — may be substantial. Opponents argue that a rapid, broad-based reopening would quickly reduce social distancing, create a false sense of optimism about contagion, and reignite the coronavirus pandemic, overwhelming hospital resources (i.e. ventilators, hospital beds, and medical professionals) and increasing coronavirus-related deaths. These arguments have framed the political debate over the efficacy of lifting SIPOs and reopening non-essential businesses (Colliver 2020, Fadel 2020, Usero 2020).

However, it is also possible that lifting SIPOs may have much smaller effects on social distancing, COVID-19 cases, and unemployment rates than both proponents and opponents suggest. If most social distancing behavior and job loss are not caused by mitigation policies, but rather are explained by demand shocks caused by rapid diffusion of COVID-19 information or via Bayesian updating of coronavirus risk assessment (Barrios and Hochberg 2020, Holtz et

[1] Individuals under a SIPO are only allowed to leave their homes for "essential" activities such as shopping for food or medicine, reporting for work in an industry deemed essential, or caring for a sick relative.

al. 2020), the effects of lifting SIPOs may be quite small.[2] Moreover. the elasticity of social distancing (and COVID-19 cases) with respect to mitigation policies may fall over time as individuals learn about healthier options for population mixing (i.e. mask-wearing, 6-feet social distancing with non-household members).[3]

Using a standard difference-in-differences approach to estimate the effect of lifting a statewide SIPO on COVID-19 cases faces two first-order identification problems. First, policymakers *explicitly* tie the decision to allow a SIPO to expire to COVID-19 case growth, a textbook case of policy endogeneity. White House reopening guidelines, issued jointly with the Centers for Disease Control and Prevention recommend a "downward trajectory of documented cases within a 14-day period" before a state or region proceeds to a phased reopening (White House 2020; Centers for Disease Control and Prevention 2020). This national recommendation is in-line with state and local policies with regards to ending SIPOs.[4] For instance, Oregon rules require that "counties where more than 5 people have been hospitalized for severe COVID-19 symptoms in the past 28 days must see declining hospitalizations for 14 days in order to begin reopening" (Oregon Health Authority 2020). Similarly, New York requires "a downward trajectory of hospitalizations and infections over a 14-day period," as well as "a sustained decline in the three-day rolling average of daily hospital deaths over the course of a 14-day period," which like the national recommendations explicitly links trends in the outcome variable of interest to implementation of the policy (New York Forward 2020).

[2] It is also possible that SIPO adoption or lifting may impact perceptions of coronavirus risk as well as information about the virus's spread.
[3] This argument suggests that the social distancing (and case) effects of SIPO adoption and SIPO lifting may be asymmetric.
[4] While the federal government can make recommendations with regards to social distancing policies, the power to enact or revoke most of these policies lies with state and local governments.

These ties of policy to trend are not simply made explicit in the written policies, but are also publicly communicated by state leadership. To take one prominent example, in a May 22, 2020 news conference, New York governor Andrew Cuomo commented on reopening plans for the Mid-Hudson region (immediately north of New York City) as well as parts of Long Island, saying, "If the number of deaths continue to decline … both regions could reopen" (Newsday Staff 2020).

Second, an emerging literature documents that the enactment of statewide SIPOs, particularly those that were adopted early and in areas with low case growth (Friedson et al. 2020; Dave et al. 2020a, b) were successful at "bending the case curve" for COVID-19 (Courtemanche et al. 2020; Dave et al. 2020a). For instance, Dave et al. (2020a) find that SIPO adoption is associated with a 44 percent reduction in COVID-19 cases. Taken at face value, these results imply that pre-treatment trends in a difference-in-differences-based statewide SIPO expiration analysis will not be parallel.[5]

Together, the above insights suggest that using a difference-in-differences approach to estimate the impacts of SIPO expiration will be highly problematic for causal inference.[6,7] Thus, rather than examine gubernatorial decisions on SIPO lifting, we instead turn to a unique natural experiment to identify the causal effect of SIPO expiration on social distancing and COVID-19

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[5] This would be true among early adopting SIPO states, which were the only states for which SIPOs were found to "bend the case curve".

[6] We hypothesize that the expiration of a SIPO is much more endogenous to COVID-19 cases than was its enactment. No state or Federal guidelines of which we were aware recommended jurisdictions enact a SIPO if a case growth rate rose above a particular threshold. Further, there is little evidence of any non-SIPO policy flattening the COVID-19 case curve. The only significant estimates show benefits from bar and restaurant closures that are modest when compared to the effects of SIPOs (Courtemanche et al. 2020).

[7] Note that there is no problem of insufficient policy variation, just that the available variation is likely to be endogenous in most cases. There is a considerable amount of variation in the timing of the end of state or local SIPO, with 37 states lifting some form of social distancing policy between April 20, 2020 and May 13, 2020 (Gupta et al. 2020b). However, policies regarding coronavirus provide numerous challenges to the difference-in-differences strategy, in particular with regards to the assumption of parallel pre-policy trends (Goodman-Bacon and Marcus 2020), concerns that are exacerbated in the context of examining reopening states by ending social distancing policies as both national guidance and explicit state level policy rules tie opening behaviors to the trends themselves.

cases. This sudden, dramatic, and somewhat unexpected policy shock was generated by a state court ruling on the constitutionality of a statewide SIPO.

On May 13, 2020 in *Wisconsin Legislature v. Palm*, the Wisconsin State Supreme Court struck down Wisconsin's "Safer at Home Order" (Ruthhart 2020). The Court ruled that Andrea Palm, the secretary-designee of the Wisconsin Department of Health Services, violated state law by issuing the stay-at-home decree as an "order" instead of a "rule." This distinction allowed the Executive Branch (the governor's office) to circumvent weeks-long legislative oversight and possible veto, and instead immediately implement the policy (Supreme Court of Wisconsin 2020). While Palm argued that the specificity of the COVID-19 crisis permitted her to issue an order, the Court ruled that by bypassing a lengthy administrative rulemaking process and legislative review (Johnson 2020; Millhiser 2020), the Safer at Home Order was "unlawful, invalid, and unenforceable" (Vetterkind and Schmidt 2020; Hagemann 2020).

The force and effect of this legal ruling was dramatic and immediate. The *entire* statewide order was overturned (with the exception of the school closures; see Deliso 2020; Beck 2020), making Wisconsin the only U.S. state without a single statewide protective measure in place (Ruthhart 2020).[8] The legal ruling immediately allowed non-essential businesses to reopen without restriction, with many bars opening on the night of the decision, gaining national media attention (O'Kane 2020). Observing the night's events, Wisconsin's Governor Tony Evers said that the ruling had "throw[n] the state into chaos," and predicted that "people are going to get sick" (Evers 2020).

This study exploits this unique experiment to identify the causal effect of Wisconsin's SIPO termination on social distancing and COVID-19 cases. First, using anonymized, geospatial

[8] This decision also marked the first successful legal challenge of a SIPO (Deliso 2020; Beck 2020; Jimenez and LeBlanc 2020).

smartphone data from SafeGraph, Inc. from May 3 through May 24, and a synthetic control approach, we find no evidence that the statewide legal order significantly affected several measures of state-level social distancing: the percent of the time spent at home full-time, median hours spent at home, part-time work behavior, and full-time work behavior.[9] While we detect some evidence of a modest decline in stay-at-home behavior in the first four days following the order's enactment, the trend reverses itself thereafter producing a net null effect over the full post-treatment period.

Then, turning to Centers for Disease Control and Prevention data from May 3 through May 26 on COVID-19 cases and deaths, synthetic control estimates fail to detect any evidence that the Wisconsin Supreme Court order affected COVID-19 health, including during the period following the coronavirus's incubation. These null results are robust to (i) choice of donor states, including states that had a statewide SIPO in effect beyond the median incubation period and SIPO states that either had no reopenings or limited reopenings, and (ii) choice of observable matching variables to create synthetic weights, including COVID-19 case rates per all pre-treatment days, urbanicity rate, population density, COVID-19 testing rates, pre-treatment social distancing, and other business reopening policies.

The remainder of the paper explores the explanation for this null result and examines heterogeneous treatment effects that may be masked by our zero net effect result. We draw three conclusions from this analysis. First, while 5 of 72 Wisconsin counties enacted longer-term local safer-at-home orders to try to counter the Supreme Court decision, accounting for these county policies does not change our main finding. Second, we find no evidence that urbanized or densely populated counties were differentially affected by SIPO termination. Finally, we do find

[9] Goodman-Bacon and Marcus (2020) recommend that in the context of COVID-19 policies, researchers focus especially on techniques "that impose balance in pre-policy infection levels and trends," such as synthetic control.

some evidence of heterogeneity in the response to the Wisconsin Supreme Court decision by 2016 voting behavior of residents. In counties where a majority of residents voted for Republican President Donald Trump, the termination of the SIPO was associated with a larger short-run decline in social distancing. However, there is little evidence of higher growth in COVID-19 cases for these counties relative to the others over the post-repeal period.

2. Background and Reaction to Wisconsin Supreme Court Decision

Wisconsin saw its first case of COVID-19 on February 5, 2020 (Wisconsin Department of Health Services 2020; Wiscontext 2020). More than a month passed before the second documented case emerged on March 9. By March 25, there were 583 new confirmed cases, bringing the total number of cases to 585 or 10 cases per 100,000 population (Wisconsin Department of Health Services, 2020; Wiscontext, 2020). In an attempt to "flatten the case curve," at 8:00 a.m. on Wednesday, March 25, 2020, Andrea Palm, secretary-designee of the Wisconsin Department of Health Services (under the direction of Governor Tony Evers) signed Emergency Order 12, a statewide "Safer at Home Order" (State of Wisconsin 2020).

This SIPO required all individuals within the state of Wisconsin to stay in their place of residence at all times except for essential activities. Essential activities were defined as those activities necessary to maintain health and safety, such as obtaining medication or seeking emergency health care, grocery shopping, outdoor exercise, performing work at essential businesses or operations and related travel, and provision of care for others (State of Wisconsin 2020). Additionally, the SIPO required social distancing of six feet whenever residents leave their houses, and prohibited all non-essential travel. The order also required all non-essential business operations to cease, performing only Minimum Basic Operations (State of Wisconsin

2020).[10] Exempt from this order were businesses deemed essential, including but not limited to stores that sell food and medicine, transportation, funeral establishments, take-out services, transportation, and social service organizations (State of Wisconsin 2020).

This order was set to remain in effect until 8:00 a.m. on Friday, April 24, 2020. However, eight (8) days prior to the expiration date, Andrea Palm issued Emergency Order 28, which extended the Safer at Home order until 8:00 a.m. on Tuesday, May 26, 2020 (Office of the Governor 2020). The order also implemented changes to the original order, which were to be effective on April 24. Included in these changes were modest reopenings for non-essential businesses. Public libraries were allowed to open for curbside pick-up, golf courses were permitted to open with restrictions to ensure social distancing, in-person retail was allowed for up to five customers at a time at particular shops, arts and craft stores were allowed to offer curbside pick-up, and aesthetic work was permitted with one worker (State of Wisconsin 2020; Office of the Governor 2020). In addition, guidelines for safe business practices, including disinfecting practices and safe waiting areas or lines were also announced. Finally, all public and private schools were ordered to remain closed for the remainder of the school year.

The revised Safer at Home order was set to expire on May 26. But on April 21, the Republican-controlled Assembly and Senate, led by Senate Majority Leader Scott Fitzgerald and Assembly Speaker Robin Vos, filed a lawsuit, *Wisconsin Legislature v. Palm*, which sought to overturn the Safer at Home order on separation of powers grounds (*Wisconsin Legislature v. Palm* 2020; Millhiser 2020). While state law allows the Department of Health Services extensive power when dealing with a communicable disease, the Republican legislature claimed that the Office of the Secretary had exceeded its legal authority. In a 4 to 3 decision, issued on March

[10] These include the necessary activities to maintain the value of the inventory and capital, process payroll, facilitate remote work, and other related functions.

13, 2020, the Wisconsin State Supreme Court struck down the statewide SIPO, siding with the plaintiffs that the administration had exceeded its authority (Ruthhart 2020; Vetterkind and Schmidt 2020; Deliso 2020; Beck 2020; Jimenex and LeBlanc 2020; Hagemann 2020). In addition to striking down the SIPO, the order declared all new COVID-19 public health restrictions in Wisconsin subject to review and potential veto by legislative committee.

Political opinion in Wisconsin was divided. While Republican Senate Majority Leader Fitzgerald said that "the public started to become skeptical" of Democrat Governor Evers' ability to guide the state through the pandemic (Beck 2020), polls taken during the week the Supreme Court decision was handed down showed that the public trusted Evers with reopening of the state more than the state legislature. Additionally, polls found that nearly 70 percent of voters believed that Evers's order was appropriate given the severity of the pandemic (Ruthhart 2020; Beck 2020).[11]

Reaction to the Supreme Court decision was swift and partisan. Governor Tony Evers declared:

> "Republican legislators convinced four members of the Supreme Court to throw the state into chaos. They have no plan. People are going to get sick, and those Republicans own this chaos" (Ruthhard 2020).

whereas Republican Steve Nass, co-chairman of the Wisconsin legislature's rules committee claimed:

[11] During the decision process, dissenting justice Ann Bradley stated that "the lack of a stay would be particularly breathtaking given the testimony yesterday before Congress by one of our nation's top infectious disease experts, Dr. Anthony Fauci. He warned against lifting too quickly stay-at-home orders" (Ruthhart 2020).

> "I have great faith that people will make the decisions necessary to fight COVID-19 on their own without excessive government intervention" (Richmond 2020).

Of course, the actual response by individuals within Wisconsin remains an empirical question, and is the focus of the analyses to follow.

3. Data and Methodology

3.1 Data

To examine the effect of the Wisconsin Supreme Court decision on social distancing, we utilize data from SafeGraph Inc.[12] SafeGraph provides an anonymized population movement dataset representing approximately 45 million smartphone devices. The number of smartphone devices is aggregated to the census block level and these aggregated data are made available to members of the public who apply for them via SafeGraph. These data have been used by a growing number of scholars studying social distancing in the United States following the COVID-19 outbreak (Maclean et al. 2020; Dave et al. 2020a,b; Friedson et al. 2020; Abouk and Heydari 2020), as well as by the Centers for Disease Control and Prevention (Lasry et al. 2020). Our analysis period is 22 days from May 3, 2020 through May 24, 2020, which envelopes the Supreme Court decision that abolished the SIPO.[13] The start of our sample period also ensures that any effects we find are not confounded by the modest re-openings of non-essential businesses that were allowed starting on April 24th with the extension of the original SIPO.

[12] Data and detailed descriptions of variable construction are available at: https://www.safegraph.com/dashboard/covid19-shelter-in-place

[13] This is well after the April 7, 2020 Wisconsin primary election, which has been shown to have had an effect on COVID-19 cases in Wisconsin (Cotti et al. 2020).

From these data we collect four key state-by-day measures of social distancing. Our first measure, *Stay-at-Home Full Time*, captures the percent of the state population who remain at home for the entire day. A person's home is defined as a 153-meter by 153-meter area that receives the most frequent GPS pings during the overnight hours of 6pm to 7am. To construct this measure, each smartphone phone is assigned a "home" (or 153m by 153m square) based on a common nighttime location over a baseline period. SafeGraph then calculates the percent staying at home, i.e. the fraction of cell phones in a geographic unit (state, county, or census block) that do not leave the "home" for any given day.[14] This extensive measure of social distancing is one that we expect to be substantially affected by a state SIPO. We find that in the state of Wisconsin, 35.7 percent of respondents remained at home full-time over the sample period.[15]

Second, we measure *Median Hours at Home*, the median number of hours spent at home. This measure captures social distancing behavior at the intensive margin as well. We find that those in Wisconsin remained in their homes for a median number of 12.1 hours per day.

Third, we measure the *Median Percent Time Spent at Home*, the median percent of the time that cell phones are located at home. Our data show a median home time of 88.8 percent among those residing in Wisconsin.

Finally, we measure work behavior of state residents by whether the cell phone device was tracked as leaving the "home" area for the same destination for at least 6 hours between the hours of 8am and 6pm during the day, which is termed *Full-Time Work Behavior.* If the cell phone instead left for the same destination for 3 to 6 hours between 8am and 6pm, we define it as *Part-Time Work Behavior* Over the sample period, we find that an average of 3.5 percent of

[14] SafeGraph makes adjustments for small geographic units which are not relevant for a state-level analysis.
[15] At the start of our sample period (May 3), this fraction was 36.8 percent.

Wisconsinites engaged in full-time work behavior and 5.6 percent engaged in part-time work behavior.

Appendix Figure 1 shows trends in these four measures of social distancing for each state, with Wisconsin highlighted in black. Trends in social distancing are flat or slightly declining over this period.

To examine the short-run effects of the Wisconsin Supreme Court decision on COVID-19, we utilize a panel of state-specific daily counts of cases and deaths from May 3, 2020 through May 26, 2020. These data are collected by the Centers for Disease Control and Prevention (CDC) and made public by the Kaiser Family Foundation.[16] As of May 26, there were a total of 1,684,404 confirmed COVID-19 cases in the United States, 0.9 percent (15,923) of which were in Wisconsin, and 95,871 coronavirus-related deaths, 0.5 percent (517) of which were in Wisconsin. Our central public health outcomes of interest are $Case\ Rate_{st}$, measuring the cumulative number of confirmed coronavirus cases, and $Death\ Rate_{st}$, which is the number of coronavirus-related deaths per 100,000 population, in state *s* at day *t*. Appendix Figure 2 shows state-specific trends in cumulative coronavirus case and death rates per 100,000 population in Wisconsin as well as for the remaining 49 states and the District of Columbia.

3.2 Methods

The main aim of this study is to capitalize on the unanticipated policy shock, generated by the Wisconsin State Supreme Court's ruling, in order to identify the causal effects of the termination of the statewide shelter-in-place order on social distancing and public health. Our empirical analysis proceeds in a sequential manner to address these questions.

[16] See data available here: https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html

Before we turn to estimating effects of the termination of the SIPO, it important to establish that the original adoption of the statewide SIPO in Wisconsin (on March 25) causally impacted (i) social distancing, and (ii) the number of confirmed coronavirus cases and deaths in the state. We do so by using the synthetic control method introduced by Abadie et al. (2010) and applied by Friedson et al. (2020) for the implementation of the California SIPO, which relies on data from pre-treatment outcomes and observable characteristics of states that may influence the spread of the virus or its detection to generate a counterfactual for Wisconsin in the absence of the statewide shelter-in-place order.

Next, we continue with our synthetic control approach to infer the causal impact of the Supreme Court's ruling in Wisconsin (lifting the statewide SIPO) on social distancing and the number of confirmed COVID-19 cases and deaths. To generate a counterfactual for Wisconsin in the absence of the Supreme Court decision, we draw on our primary donor pool comprised of 17 states and the District of Columbia. For our measures of social distancing, where estimated effects of a SIPO expiration may materialize immediately, our donor pool consists of states that had a statewide SIPO in effect during the entire analysis period for which we have SafeGraph data (May 3 through May 24). For cases and deaths analysis, we expand our donor pool to include both those states that had a SIPO in effect during the entire analysis period (May 3 through May 26) as well states that allowed their SIPOs to expire, but had fewer than five days of post-treatment data, which is the median incubation period for COVID-19.

We estimate the unobserved counterfactual ("synthetic Wisconsin") as a weighted linear combination of states included in the donor pool. The weights are chosen so as to generate a synthetic state that is as similar as possible to Wisconsin on key observables. Given the importance of our selection (i) of states to be included in the donor pool, and (ii) observable characteristics on which to closely match Wisconsin to its synthetic counterpart, we explore the sensitivity of our estimates to these choices (Ferman 2019).

Our choice of the donor pool is informed by requiring that all control states had a SIPO in effect during the entire period under study. We also experiment with limiting the donor pool further by excluding (i) any state that even partially permitted reopening of restaurant and other food services with in-room dining (even at limited capacity) or retail, mall, or movie theatre reopenings beyond curbside pickup or drive-in movies, or (ii) any state wherein more than 50 percent of the population resides in counties that permitted any reopening of these non-essential businesses and services.

With regard to the choice of observables used to select our synthetic control from among the donor states, we take several approaches. In one strategy, we match on each of 10 days (May 3 through May 12) of pre-treatment social distancing and confirmed COVID-19 case rates per 100,000 population, which effectively requires growth rates to be identical. While choosing a counterfactual based only on pre-treatment outcomes eliminates concerns of 'p-hacking' (Hansen et al. 2020; Botosaru and Ferman 2017), this approach also effectively eliminates the role of other factors that could affect COVID-19 outbreak (Kaul et al. 2018).[17]

Thus, in other approaches, we match on (i) state population density and a state urbanicity index, factors that play an important role in COVID-19 spread (Friedson et al. 2020; Dave et al. 2020a,b), (ii) COVID-19 testing rates, which may play an important role in coronavirus detection, (iii) other pre-treatment COVID-19 policies (i.e. whether the state permitted state parks to be open and whether the state permitted roadside pickup of retail, both of which Wisconsin had prior to the Supreme Court decision), and (iv) social distancing prior to the

[17] As shown by Kaul et al. (2018), matching on all periods of pre-treatment outcomes renders all covariates irrelevant in the prediction of the outcome.

Supreme Court Decision. To conduct hypothesis tests, we conduct placebo tests following the method suggested by Abadie et al. (2010) to generate permutation-based p-values.

Next, we carry over the control states identified in the synthetic control approach and also estimate the following baseline difference-in-differences specification, drawing upon county-by-day data from Wisconsin and the control states:

$$Y_{cst} = \beta_0 + \beta_1 * SIPOEXP_{cst} + \beta_2 * BUSINESSREOPEN_{st} + \beta_3 * CAREREOPEN_{st} + \beta_4 * ACTIVITYREOPEN_{st} + \alpha_{cs} + \gamma_t + \varepsilon_{cst} \quad (1)$$

where Y_{cst} measures one of our outcome variables (social distancing, log COVID-19 cases, log deaths) in county *c* in state *s* on day *t*, and SIPOEXP is an indicator set equal to 1 if the observation is drawn from Wisconsin in the post-Supreme Court period. The sample is comprised of counties in Wisconsin and in each of the donor states that received a positive weight in the synthetic control model. $BUSINESSREOPEN_{st}$ is an indicator for whether the state had begun a partial reopening of restaurants, bars, and retail stores such as roadside pick-up, and limited capacity. $CAREREOPEN_{st}$ is an indicator for whether the state had begun a reopening of personal or pet care, including barber, salons, and pet grooming services. $ACITIVTYREOPEN_{st}$ is an indicator for whether the state had begun a partial reopening of activities and entertainment including gyms, state parks, and drive-in movie theatres. In addition, α_c is a set of county fixed effects to control for fixed differences across states in social distancing or COVID-19 infections due to, for example, baseline hospital capacity differences, population density, the presence of an important airport hub, or baseline testing capacity; γ_t is a set of day fixed effects to control for national factors that commonly affect our outcomes.[18] Regressions are weighted using synthetic weights.

In alternate specifications, we also add controls for state-specific linear time trends (α_s*t) to capture any unmeasured area-level time trends that could be coincidentally associated with COVID-19 growth and with the Supreme Court decision. The locality-specific trends can help account for unobserved factors driving the exponential growth trajectory of transmissions, and effects in this case would be identified off deviations from this trend growth (Dave et al 2020a).

The advantage of the county-by-day difference-in-differences setup is that it allows us to explore heterogeneity in the effect of the Wisconsin Supreme Court decision across several margins, as follows:

$$Y_{cst} = \beta_0 + \beta 1 * (X_c * SIPOEXP_{cst}) + \beta_2 * BUSINESSREOPEN_{st} + \beta_3 * CAREREOPEN_{st} + \beta_4 * ACTIVITYREOPEN_{st} + \alpha_{cs} + \gamma_t + \varepsilon_{cst} \quad (2)$$

In equation (2), X_c denotes the specific dimension that may drive potential differential responses in Wisconsin to the Supreme Court's rescinding of the statewide SIPO.

First, we consider whether the county issued a local stay-at-home order in response to the statewide termination. Fourteen of the state's 72 counties responded to the Supreme Court ruling by enacting policies to mitigate the potential effects of the lifting of the statewide order. Extenders included Dane and Milwaukee counties – population centers that contain the cities of Madison and Milwaukee, respectively – as well as several other less urban counties. These localities effectively extended the governor's shelter-in-place order by re-issuing makeshift local public health orders, and conveying to residents and businesses that a local order remains in

[18] The day fixed effects also flexibly control for any intra-week cyclical variation (for instance, weekday vs. weekend or holiday effects) that may be driving the demands for time, economic and non-economic activity, and hence social distancing.

effect in spite of the state order being overturned. For most of these localities, the extensions and stays were temporary, on average lasting only three to four days beyond the Supreme Court ruling, and enacted mainly as a stop-gap measure to give businesses some leeway to prepare to open or resume. Five counties, representing 30.9 percent of the state's population, however prolonged their local stay-at-home orders longer, and residents in these counties continue to be bound by their local SIPOs as of the end of our sample period.[19]

While the Supreme Court ruling was binding for most Wisconsinites, we assess whether there were any differential effects in social distancing and COVID-19 cases across counties that strictly abided by the ruling and its timing vs. counties that responded to the ruling by extending their local orders either temporarily or for a more protracted period. We estimate equation (2) by interacting an indicator (X_c) for whether the county issued an extension (either a stop-gap temporary or prolonged local order) in response to revocation of the statewide SIPO.

Next, we explore heterogeneity in the effects of the repeal of the SIPO by urbanicity and population density, by alternately interacting the SIPO repeal (SIPOEXP) by (i) whether the county had an urbanicity rate of at least 50 percent (X_c; 26 of all 72 Wisconsin counties); and (ii) whether the county had population density of at least 75 persons per square mile (X_c; 24 of 72 Wisconsin counties). Prior work has established that state SIPOs as well as localized SIPOs are more effective in states and counties that are highly urbanized and densely populated (Dave et al. 2020a, b). The larger gains from SIPOs in these areas derive from urbanicity and population density being important predictors of social interactions and potential magnifiers of infection transmission. These studies find that shelter-in-place orders tend to elicit a larger response vis-a-

[19] These five counties are: Dane, Eau Claire, Florence, Milwaukee, and Racine. The other nine counties with temporary stays are: Kenosha, Calumet, Outagamie, Winnebago, and Brown, with extensions of local orders ranging from 1-3 days; and Marquette, Green, Door, and Rock, with extensions ranging from 5-9 days.

vis social distancing in more urban and populated areas, and also that a given level of social distancing may translate into larger gains in the containment of COVID-19 infection in these areas. While we do not expect the effects of the initial adoption of the statewide SIPO and its subsequent repeal to be symmetric, these considerations warrant an exploration of whether the average statewide effect is masking important heterogeneity across these dimensions. Moreover, behavioral responses in terms of mobility and sheltering-in-place to the lifting of a SIPO may vary depending on options for outside activities, risk perceptions, and population mixing, all of which are likely to differ across urban (more densely populated) vs. non-urban (sparsely populated) areas.

Finally, we consider whether the effects of the Supreme Court decision differed based on political preferences, by interacting the main effect in equation (2) with an indicator (X_c) for whether a majority of the county voters voted for Republican presidential candidate Donald Trump in 2016. Given the divided political opinion in the state, and the split decision across party lines, ideology may well impact the degree to which residents heeded the Democratic governor's admonition to continue sheltering-in-place after the repeal of the statewide SIPO.

For the difference-in-differences analyses, with a single treated state and a few control states, deriving inferential statistics based on state-clustered standard errors is not an option as these would likely overestimate statistical significance (Cameron and Miller 2015; Cameron, Gelbach, and Miller 2008). We therefore conduct statistical inference via permutation-based p-values generated by rank tests, which imposes a very high standard for achieving statistical significance (Cunningham and Shah 2018). This involves comparing our treatment effect generated from the difference-in-differences model (equation 1 or 2) with placebo estimates obtained by running additional specifications, in each case replacing Wisconsin (the true treated unit) with an indicator for one of the other control states. Since the number of control states identified from the synthetic control approach is a small subset of the donor pool, achieving 5 percent and 10 percent significance is often not possible in our case. For instance, if the total number of states (WI + control states) in a given difference-in-differences model is nine, then achieving at best 11.1 percent statistical significance requires that Wisconsin be ranked at the very extreme of the placebo distribution. We present these rank tests for all estimates, and draw conclusions from the weight of the evidence from the magnitudes, any consistent patterns, and inferential statistics.

4. Results

We present our main findings of Wisconsin's statewide SIPO repeal, driven by the abrupt and unanticipated Supreme Court ruling, on measures of mobility and on COVID-19 related health outcomes in Tables 1 and 2, and in Figures 1-3. Estimates of the heterogeneity analyses are presented in Table 3 and in Figures 4-6, and additional analyses addressing specific issues are presented in the Appendix.

4.1 Wisconsin's SIPO Repeal and Social Distancing

Figure 1 presents trends in the four measures of social distancing and mobility, drawn from the anonymized cell-phone geotagged data from Safegraph, for both Wisconsin and its synthetic control.[20] The synthetic control assigns weights based on close matches in each of three days in the pre-repeal period (May 3, 7 and 12) with respect to the social distancing outcome under consideration as well as the urbanicity rate of the state. This constructed synthetic control

[20] Appendix Table 1 reports the covariate match for the synthetic control analyses of social distancing outcomes.

serves as our counterfactual for trends in social distancing that would have unfolded in the absence of Wisconsin's Supreme Court decision.

Panel (a) plots Wisconsin and synthetic Wisconsin for the outcome of the percent of respondents staying at home throughout the day, Panel (b) repeats this exercise for an intensity measure capturing the median daily hours spent at home, and Panel (c) utilizes another intensity measure, the median percent of daily hours spent at home. These analyses highlight three key points. First, the trends in staying-at-home behaviors in Wisconsin and synthetic Wisconsin are nearly identical and move lock-step in the pre-repeal period. Second, there is a slight declining trend in these measures of social distancing throughout the sample period for both Wisconsin and its control, with some intra-week variance driven by weekday vs. weekend effects. Third, there is little evidence of any significant or substantial break in the trend or a sustained decrease in sheltering-in-place in Wisconsin, relative to synthetic Wisconsin, after the statewide repeal. There is some suggestive indication of dynamics in the very short run, with the percent staying at home (and to some extent the percent of time spent at home) in Wisconsin declining by May 15th (Friday) relative to the control; the magnitude of the effect is about 2 percentage points (about 5 percent relative to the baseline mean in the state).[21] However, sheltering-in-place quickly rebounds over the next two days, with little discernible difference in subsequent trends between treated Wisconsin and its synthetic control. For the last 3 days of the sample (over a week after the SIPO was struck down), both median hours at home and median percent of time at home experience a small decrease in Wisconsin relative to synthetic Wisconsin, though neither effect is statistically distinguishable from zero at conventional levels.

[21] Appendix Figure 3 presents the placebo tests for each of the social distancing and mobility measures. The short-term dynamics in sheltering-at-home are more apparent here (Panels a, b and c) when contrasted against the placebo effects. The decline in the percent staying at home and the median hours spent at home within 2 or 3 days post-repeal have one-sided, one-tailed permutation based p-values of 0.167 and 0.278, respectively.

Since the repeal of the statewide order allowed non-essential businesses to reopen without restriction, we also assess effects on part-time and full-time work outside the home (Panels d and e). As with the stay-at-home behaviors, trends in working outside the home are virtually identical across Wisconsin and its control, both before and after the repeal, providing extremely little evidence that the Supreme Court ruling led to any substantial or detectable increase in mobility outside the home.[22]

In Table 1, we report estimates of the average daily effect of the repeal of the state's SIPO on each of the social distancing measures.[23] The above discussion of the visual trends between Wisconsin and synthetic Wisconsin prefigures the effect magnitudes and their statistical significance reported in the table. Column (1) presents estimates of the average policy effect over the post-repeal period, comparing Wisconsin to its synthetic control, where the synthetic control is formed by matching on the outcome in each of three pre-treatment days (May 3, 7, and 12) and urbanicity (as presented in Figure 1). While the effects of the repeal on stay-at-home behaviors at the intensive margin are negative, the magnitudes are not economically or statistically significant. We also do not uncover any substantial increases in working outside the home during the day.

The remaining columns in Table 1 assess the robustness of these findings to the choice of observable controls and donor states. In columns (2) and (3), we show the robustness of findings in column (1) to matching on population density and both urbanicity and population density, as well as three pre-treatment days of social distancing data. The results are unchanged.

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[22] The intra-week cycle, capturing weekend vs. weekday effects, is expectedly more pronounced for outside-the-home full-time work than for part-time work.
[23] Appendix Table 2 reports the donor states receiving positive weights for each analysis in Table 1.

To ensure that endogenous COVID-19 testing is not biasing the estimated effect of Wisconsin's repeal, in column (4) we supplement the matching strategy by assuring similarity across Wisconsin and its control on testing rates across the pre-policy period, in addition to pre-treatment matches on the social distancing outcome for three days (May 3, May 7 and May 12).

Given that Wisconsin's overturning of its statewide SIPO was a policy shock, largely unanticipated and abrupt, being a result of the state Supreme Court deeming it unconstitutional, we are less concerned with policy endogeneity. Nevertheless, column (5) augments the matching strategy to ensure that Wisconsin and its control also explicitly match on COVID-19 cases. The results are unchanged.

Next, we explore the sensitivity of findings to matching on similar reopening policies as Wisconsin had in place before the Supreme Court decision, specifically opening of public parks and limited retail openings (i.e. roadside pickup and some in-shop openings). Our findings from this synthetic control match, shown in column (6) are generally consistent with prior estimates.

While our donor pool is restricted to states that had a statewide SIPO in place throughout much of the sample period, one concern is that some of these states nevertheless permitted partial re-openings of non-essential services and business or contained counties that may have permitted limited re-openings. The endpoint of our sample period ensures that we are not capturing effects of any other state fully reopening; nevertheless, even partial reopenings for some services and businesses may contaminate the donor pool and bias Wisconsin's SIPO repeal effect toward zero. In column (7), we assess sensitivity to excluding all states from the donor pool that permitted any partial re-opening of restaurants or bars, or contained counties (covering at least 50 percent of the state population) that permitted such partial re-opening. Our results are unchanged.

Finally, in column (8), we explore the sensitivity of our findings to matching on each of the 10 days of pre-treatment days of social distancing data. The weight of the evidence across this matching scheme, for each of the social distancing measures, points to no significant or meaningful increase in mobility outside the home or working outside the home.

4.2 Wisconsin's SIPO Repeal, COVID-19 Confirmed Cases and Mortality

Our findings thus far indicate that the overturning of the statewide shelter-in-place order in Wisconsin did not effectively lead residents to spend more time outside their homes, except perhaps in the very immediate term following the repeal. Given the integral role played by person-to-person contact in the infection transmission mechanism, if the lifting of the statewide order did not lead to any substantial or sustained first-order effects in increasing mobility outside one's home, it would be unlikely that there would be strong effects on COVID-19 cases and deaths. We confirm this in the next set of results.

Figure 2 visually presents effects of the repeal on confirmed cases, by graphing trends between Wisconsin and its synthetic counterfactual.[24] Panel (a) matches on pre-treatment cases per 100,000 population as well as urbanicity, Panel (b) augments the matching to include COVID-19 testing rates, and Panel (c) matches on sheltering-at-home measures (in addition to outcome matches at interim points over the pre-policy period). Finally, in Panel (d), we explicitly match on COVID-19 cases per 100,000 population in each of the 10 days prior to the SIPO repeal in Wisconsin, effectively matching on the case growth rate. Expectedly, trends in confirmed cases identically track across Wisconsin and synthetic Wisconsin over the entire sample period, providing no sign that the repeal of the statewide SIPO led to any discernible

[24] Appendix Table 3 reports the covariate match for the synthetic control analyses of COVID-19 cases and deaths.

increase in confirmed infections. Estimates in Panel I of Table 2 largely confirm these findings.[25]

One concern regarding the lack of any strong effects for COVID-19 cases is that the post-repeal sample period might not be sufficiently long enough as of yet to detect a resurgence or increase in the infection rates. While this is a possibility, we note that our sample includes 14 days of data following the revocation of the statewide SIPO. The median incubation period for COVID-19 is 5.1 days, with 75 percent of all infected individuals seeing symptoms within 6.7 days and 97.5 percent seeing symptoms in 11.5 days (Li et al. 2020). Prior work has uncovered strong effects of shelter-in-place orders on confirmed cases within five to ten days following the adoption of the policy (Friedson et al. 2020; Dave et al. 2020 a, b; Courtemanche et al. 2020). Hence, if there are any meaningful changes in COVID-19 cases as a result of the repeal, our post-repeal window of 14 days is long enough to be able to capture them.

Is it possible that the lack of an effect of the SIPO repeal on social distancing and cases is due to the original SIPO not being effective in driving social distancing and containment of cases in Wisconsin? That is, if the original statewide order was ineffective, then its repeal would likely be policy neutral and also expected to have no major impact. This explanation is unlikely for two reasons. First, there is consistent evidence in the literature that SIPOs have been effective in reducing the growth in COVID-19 cases and mortality (Friedson et al. 2020; Dave et al. 2020 a, b; Courtemanche et al. 2020), particularly among states and localities that act early. Wisconsin was among the early adopters, enacting its statewide order on March 26, relatively early during its outbreak cycle – precisely the conditions under which statewide SIPOs have been found to

[25]Appendix Table 4 reports the donor states receiving positive weights for each analysis in Table 2.

reap the largest public health benefits (Dave et al. 2020a).[26] Second, when we compare Wisconsin to synthetic Wisconsin over the period that enveloped the initial SIPO adoption (March 15 through May 9) but predated the repeal, we find strong evidence that the statewide SIPO was effective in reducing COVID-19 cases (see Appendix Figure 4). In fact, the statewide shelter-in-place order significantly flattened the growth curve in WI relative to its counterfactual, and is predicted to have reduced the number of cases by 300 per 100,000 as of May 9.

As we do not find any strong effects on COVID-19 cases, we would not expect any effects on mortality, which operates with an even longer lag given the amount of time from exposure to presentation of symptoms to acute respiratory distress and hospitalization to death. Panel II of Table 2 confirms that there are no significant or meaningful effects on mortality as a result of the repeal. Trends in Figure 3 confirm this pattern of mortality results.

4.3 Heterogeneity in the Effects of the Supreme Court Repeal

Given consistent evidence across all sets of models and outcomes that the state Supreme Court's overturning of the shelter-in-place order, *on average*, had no major effect on mobility outside the home or on COVID-related health measures, we next assess whether this average policy response is masking heterogeneity across important margins that vary spatially. We present these results in Table 3, based on the difference-in-differences setup (equations 1 and 2) applied to county-by-day data. Controls are drawn from states in the donor pool, which received positive weights and were part of the construction of the counterfactual under the synthetic control approach.

[26] When Wisconsin implemented its statewide shelter-in-place order, it had 12 (per 100,000 population) confirmed cases compared to the national average at the time of 27 cases (per 100,000).

Panel I presents the baseline estimates, based on equation (1). They suggest some negative effects on stay-at-home behaviors at the intensive margin, though the effects are small and not statistically significant.[27] We note that because we draw inferences based on the demanding permutation-grounded rank tests, achieving statistical significance at conventional levels is not possible given the limited number of states that drive the analyses (WI + control states). For instance, percent of time spent at home declines in Wisconsin by 0.94 percentage points (or 1 percent relative to the mean stay-at-home full-time behavior); given that the effect in Wisconsin was fourteenth largest when compared with the 17 placebo effects, the implied p-value is .777 (or 14/18).

Most of the counties that extended their SIPO, in response to the Supreme Court's decision, did so only temporarily for a few days, as a stop-gap measure designed to give residents and businesses a chance to prepare for the re-opening. Five counties, however, extended their localized order for longer, until the original expiration date of the statewide SIPO or until further notice by the county health department; for these counties. For these counties, their local SIPO was still in effect for residents as of the end or our sample period. Appendix Figure 5 shows the growth in cases across these sets of counties, prior to the repeal, and do not show any systematic difference between counties that extended their local orders and those that undertook no response.

In Panel II, we assess whether Wisconsinites residing in the 58 counties, that accepted the Supreme Court's cancellation of the SIPO, responded any differently from those residing in the other 14 counties, which had countered the ruling by extending their local orders. Judging from the patterns and effect magnitudes, there is some suggestive evidence that time spent at home

[27] Estimates from models that alternately control for state-linear trends are presented in Appendix Table 5. The results are largely unaffected.

declined more for the bound counties relative to the counties that had extended their local orders and tried to mitigate the impact of the ruling. Median percent of time spent at home decreased by 1.5 percentage points in the non-extending counties, compared with a 0.3 percentage point decline among residents in counties that extended the local SIPO.

In Panel III of Table 3, we specifically consider if there are differential responses across these five counties versus the remaining 67 counties that lost SIPO coverage right away or within a few days of the Supreme Court ruling. Judging only for the effect magnitudes, time spent at home falls somewhat more among the 67 counties that lifted their SIPO circa the Supreme Court repeal than for the five counties that are still covered by local orders; the effects however are still small overall and not precisely estimated. And, we find no evidence that COVID-19 case growth grew more substantially in those Wisconsin counties where the Supreme Court decision was fully binding.

As an alternative approach for addressing the fact that certain Wisconsin counties were more fully bound by the Supreme Court decision that others, we create a “Bound Wisconsin” jurisdiction comprised of the 58 counties of Wisconsin for which the court order applied during the sample period. Then we use the donor pool of SIPO states to match our bound treatment state. As the results in Figure 4 show, while there are some small declines in staying-at-home in Wisconsin relative to its counterfactual, these estimates do not achieve statistical significance. We continue to find no substantial increases or acceleration in the trend of COVID-19 cases

(Figure 5) or deaths in Wisconsin (Figure 6) following the repeal.[28, 29] As discussed above, theabsence of a subsequent effect of the repeal for "bound Wisconsin counties" is not because there was no initial effect of the statewide SIPO. Appendix Figure 6 confirms that staying-at-home full-time increased significantly after the initial statewide order among these 58 counties, which were bound later by the Supreme Court ruling. Moreover, COVID-19 case growth among these 58 counties had significantly and substantially flattened in response to the original statewide order.

Next, we assess whether the essentially null effects we find in relation to the repeal in Wisconsin are conflating differential effects across urban and non-urban areas. On the one hand, opportunities for mobility outside the home and options for economic and non-economic activity, which may drive such mobility, are larger in urban areas. This may lead to a decline in social distancing in urbanized counties upon the revocation of a SIPO. However, a higher perceived risk of infections in urban areas may also moderate this response. Furthermore, if urbanicity is correlated with political preference, this may further lead to differential responses, an issue we return to below. Similar considerations warrant an exploration in differences in the effects across population density. Panels IV and V present these results, comparing policy responses across urbanized vs. non-urbanized counties, and across densely vs. sparsely populated

[28] In Appendix Table 6A and 6B, we replicate our main analyses using only *within-Wisconsin* variation, driven by the county-level counters to the lifting of the state order. While this variation appears to be orthogonal to pre-repeal growth rates across extending and non-extending counties (which we expect given that they were mostly imposed as a stop-gap measure rather than in response to health trends; see Appendix Figure 5), we interpret these results with some caution. The within-Wisconsin analyses serve two purposes. First, this can yield greater identifying variation and statistical power, improving the precision of the estimates. Second, given findings across the board from the cross-state analyses of no substantial impact on social distancing or health outcomes, we want to confirm that these effects are not masking important intra-state effects and that a within-state analysis also leads to similar results. While we find evidence that SIPO expiration increased mobility outside the home, from the lifting of a county-level SIPO, with the effects more precisely estimated in these analyses, the effect magnitudes are fairly small (Appendix Table 6A). The decrease in stay-at-home behaviors does not translate into any large or discernible increase in confirmed COVID-19 infections or deaths (Appendix Table 6B).

[29] Appendix Tables 7 and 8 show point estimates and permutation-based p-values for our synthetic control estimates for "Bound Wisconsin," confirming the pattern of results described in Figures 4 through 6.

counties in Wisconsin. These estimates indicate a somewhat larger reduction in percent of time spent at home in non-urbanized counties relative to urban counties (1.6 percentage points vs. 0.7 percent point, daily). However, the patterns for median hours spent at home are not consistent.

The U.S. response to the COVID-19 outbreak, to some extent, has been divided along partisan lines (Simonov et al. 2020). In Panel VI, we therefore assess if there are differential responses in stay-at-home behaviors based on ideology, as measured by the share of Trump voters in the county. Here we find some evidence that counties, in which the majority of voters voted for Trump, experienced somewhat larger declines in stay-at-home behaviors (time spent at home) relative to counties in which the share of votes for Trump was below 50 percent. This is consistent with research indicating that individuals residing in counties with a higher share of Trump voters are less likely to engage effort in searching for information on the coronavirus and follow social distancing guidelines (Barrios and Hochberg 2020).

Despite dome evidence of heterogeneous effects on social distancing by urbanicity and population density, the results shown in columns (6) and (7) provide no consistent or meaningful differences in the effects on COVID-19 cases or mortality across political margins.[30]

5. Conclusion

Isolating the causal effect of SIPO repeal on COVID-19-related health is quite difficult due to policymakers' *explicit* linking of COVID-19 case growth to SIPO lifting. The sudden and largely unanticipated removal of Wisconsin's SIPO by the *Wisconsin Legislature v. Palm*

[30] In Appendix Table 9A and 9B, we revisit heterogeneity in the policy response with the within-state difference-in-differences models. Given some indication of the dynamics in the policy response (Appendix Table 6A and 6B) and variation in the length of time that the county extensions remained in effect, these models separate out effects across margins that vary at the county level and across timing windows. Our results are, in the main, consistent with our heterogeneity analysis that incorporates the donor pool in the analysis.

decision created a unique opportunity to examine removal of a SIPO that was not explicitly contingent on pre-existing trends in COVID-19 caseloads. The laboratory provided by Wisconsin is perhaps the best opportunity to-date to credibly study the effects of lifting a SIPO.

We find that the removal of the SIPO had only modest effects on measures of social distancing behavior, causing individuals to venture outside of their homes more often. Other measures of distancing were unaffected. These increases in mobility were somewhat larger in more densely populated areas, and in locations that disproportionately supported President Trump in the 2016 presidential election. These findings were not due to some counties enacting their own SIPOs after the statewide order was struck down.

This is evidence that the effect of lifting a SIPO is not necessarily symmetric to that of first enacting the order.[31] For example, mobility outside of one's home is a function of many factors, including risk perceptions and knowledge of risk mitigation behavior can change over time. SIPOs may have been enacted during a time where people perceived little risk and knew little about proper protective behavior (such as wearing masks), binding in a powerful way to curb socially driven infection. Then, SIPOs might be lifted at later times after perceptions and behavior have had a chance to adjust, meaning that individuals might engage in more social distancing behavior even without the presence of the policy. Thus, in the case of Wisconsin, it is possible that the policy may have been far less binding at the time it was struck down. There are of course other factors that could be at play, such as outside options for economic and non-economic activity worsening due to the outbreak.

We also do not find any discernible or substantial increase in COVID-19 cases or acceleration in the growth of cases due to the *Wisconsin Legislature v. Palm* decision during the

[31] The case for asymmetry is strengthened by our estimation of decreases in COVID-19 case growth from the enactment of Wisconsin's statewide SIPO.

fortnight following its issuance. This is due at least in part to the lack of large change in social distancing behavior, and may also be explained by individuals successfully engaging in avoidance behaviors on other margins (such as maintaining 6 foot distances from other when out in public or wearing masks). These findings cast doubt on the assertion that reopening states by lifting SIPOs will necessarily cause substantial erosion in the containment of the virus. Lifting SIPOs only means that individuals regain the right to engage in certain public behaviors. This does not mean that individuals will exercise that right, and does not mean that if they do, that they will not do so responsibly.

There are a few important limitations of our study worthy of note. First, we note that future researchers will be limited in examining longer-run impacts of the Wisconsin Supreme Court decision. As more states repeal their orders (the District of Columbia, Illinois, North Carolina, and Ohio have lifted their orders during the week of May 22-29), the donor pool of SIPO states will shrink and the quality of the pre-treatment match for Wisconsin will diminish. Thus, it is fair to say that the short-run effects of the Wisconsin Supreme Court decision will be easier to isolate than its longer-run effects. However, we emphasize that prior studies of the case effects of SIPOs have found that such divergence in trends begins 5 to 7 days following enactment, so we are fairly confident that our research design would have identified the beginnings of such a trend divergence. Second, the Wisconsin experience may not generalize to all states, limiting our study's external validity. Still, we believe that the gains from greater internal validity will be very valuable for future policymakers assessing the potential asymmetric effects of SIPO lifting and adoption.

6. References

Abadie, A., Diamond, A. and Hainmueller, J. (2010). "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program." *Journal of the American Statistical Association* 105 (490): 493–505.

Abouk, R, and Heydari, B. (2020). "The Immediate Effect of COVID-19 Policies on Social Distancing Behavior in the United States." Retrieved from SSRN: https://ssrn.com/abstract=3571421

Andersen, M., Maclean, J.C., Pesko, M.F., and Simon, K.I. (2020). "Effect of a Federal Paid Sick Leave Mandate on Working and Staying at Home: Evidence from Cellular Device Data." *NBER Working Paper No. 27138.*

Baek, C., McCrory, P.B., Messer, T., and Mui, P. (2020). "Unemployment Effects of Stay-at-Home Orders: Evidence from High Frequency Claims Data" *IRLE Working Paper* #101-20.

Barrios, J.M. and Hochberg, Y. (2020). "Risk Perception Through the Lens of Politics in the Time of the COVID-19 Pandemic." *NBER Working Paper No. 27008.*

Beck, M. (2020, May 13). "Wisconsin Supreme Court strikes down Governor's stay-at-home order." *USA Today*.

Beck, M., Schneider, D., BeMiller, H., Brophy, N., and Marley, P. (2020, May 14). "'OPEN IMMEDIATELY!': Wisconsinites Head Out to Bars After State Stay-At-Home Orders Lifted." *USA Today*.

Botosaru, I., & Ferman, B. (2019). "On the Role of Covariates in the Synthetic Control Method." *The Econometrics Journal* 22(2): 117-130.

Cameron, A.C., Gelbach, J.B., and Miller, D. (2008). "Bootstrap-Based Improvements for Inference with Clustered Errors." *Review of Economics and Statistics* 90: 414–427.

Cameron, A.C. and D. Miller. (2015). "A Practitioner's Guide to Cluster-Robust Inference." *Journal of Human Resources*, 50(2): 317-372

Centers for Disease Control and Prevention. (2020). "CDC Activities and Initiatives Supporting the COVID-19 Response and the President's Plan for Opening America Up Again." Retrieved from: https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/CDC-Activities-Initiatives-for-COVID-19-Response.pdf

Colliver, V. (2020, May26). "Santa Clara Health Officer Suggests California is Reopening Too Soon." *Politico.*

Cotti, C.D., Engelhardt, B., Foster, J., Nesson, E.J., and Niekamp, P.S. (2020). "The Relationship between In-Person Voting, Consolidated Polling Locations, and Absentee Voting on Covid-19: Evidence from the Wisconsin Primary." *NBER Working Paper No. 27187.*

Couch, K.A., Fairlie, R.W. and Xu, H. (2020). "The Impacts of COVID-19 on Minority Unemployment: First Evidence from 2020 CPS Microdata." *IZA Discussion Paper No. 13264.*

Courtemanche, C., Garuccio, J., Le, A., Pinkston, J. and Yelowitz, A., (2020a). "Strong Social Distancing Measures In The United States Reduced The COVID-19 Growth Rate: Study Evaluates The Impact Of Social Distancing Measures on The Growth Rate of Confirmed COVID-19 Cases Across the United States." *Health Affairs,* pp.10-1377.

Courtemanche, C.J., Garuccio, J., Le, A., Pinkston, J.C. and Yelowitz, A., (2020b). "Did Social-Distancing Measures in Kentucky Help to Flatten the COVID-19 Curve?" *Working Paper.*

Cunningham, S. and Shah, M., (2018). "Decriminalizing Indoor Prostitution: Implications for Sexual Violence and Public Health." *The Review of Economic Studies*, 85(3), pp.1683-1715.

Dave, D.M., Friedson, A.I., Matsuzawa, K. and Sabia, J.J., (2020a0. "When Do Shelter-In-Place Orders Fight COVID-19 Best? Policy Heterogeneity Across States And Adoption Time." *NBER Working Paper No. 27091.*

Dave, D.M., Friedson, A.I., Matsuzawa, K. Sabia, J.J., and Safford, S. (2020b). "Were Urban Cowboys Enough to Control COVID-19? Local Shelter-In-Place Orders and Coronavirus Case Growth." *NBER Working Paper No. 27229.*

Deliso, M. (2020, May 14). "Governor Reacts to State Supreme Court Blocking Stay-At-Home Order." *ABC News*.

Doyle, O., (2020). "COVID-19: Exacerbating Educational Inequalities?" *Working Paper.*

Fadel, L., (2020, May 9). Public Health Experts Say Many States Are Opening Too Soon To Do So Safely. *National Public Radio.*

Ferman, B., Pinto, C. and Possebom, V. (2017). "Cherry Picking with Synthetic Controls."

Friedson, A.I., McNichols, D., Sabia, J.J. and Dave, D., (2020). "Did California's Shelter-In-Place Order Work? Early Coronavirus-Related Public Health Effects." *NBER Working Paper No. 26992.*

Galea, S., Merchant, R.M. and Lurie, N. (2020). "The Mental Health Consequences of COVID-19 And Physical Distancing: The Need for Prevention And Early Intervention." *JAMA Internal Medicine.*

Goodman-Bacon, A., and Marcus, J. (2020). "Using Difference-in-Differences to Identify Causal Effects of COVID-19 Policies." *Working Paper*.

Gupta, S., Nguyen, T.D., Rojas, F.L., Raman, S., Lee, B., Bento, A., Simon, K.I. and Wing, C. (2020). "Tracking Public and Private Responses to the COVID-19 Epidemic: Evidence from State and Local Government Actions" *NBER Working Paper No. 27027.*

Hagemann, H. (2020, May 13). "Wisconsin Supreme Court Overturns The State's Stay-At-Home Orders." *NPR*.

Hansen, B., Miller, K. and Weber, C., (2020). "Early Evidence on Recreational Marijuana Legalization and Traffic Fatalities." *Economic inquiry*, 58(2), pp.547-568.

Hsing, A., Zhang, J.S., Peng, K., Lin, W.K., Wu, Y.H., Hsing, J.C., LaDuke, P., Heaney, C., Lu, Y. and Lounsbury, D.W. (2020). "A Rapid Assessment of Psychological Distress and Well-Being: Impact of the COVID-19 Pandemic and Shelter-in-Place." Retrieved from: SSRN 3578809.

Holtz, D., Zhao, M., Benzell, S.G., Cao, C.Y., Rahimian, M.A., Yang, J., Allen, J., Collis, A., Moehring, A., Sowrirajan, T., Ghosh, D., Zhang, Y., Dhillon, P., Nicolaides, C., Eckles, D., and Aral, S. (2020). "Interdependence and the Cost of Uncoordinated Responses to COVID-19" *Working Paper.*

Jarvie, J. (2020, May 23), "Georgia Reopened First, What The Data Show Is a Matter of Fierce Debate." *Los Angeles Times.*

Johnson, S. (2020, May 5). "As State Supreme Court Hears Arguments, Wisconsin's Stay-At-Home Order Hangs in Balance." *Wisconsin Public Radio*.

Jimenez, O. and LeBlanc, P. (2020, May 14). "Wisconsin Supreme Court Strikes Down State's Stay-At-Home Orders" *CNN*.

Kaul, A., Klößner, S., Gregor, P. and Schieler, M. (2015). “Synthetic Control Methods: Never Use All Pre-Intervention Outcomes Together with Covariates.” Working Paper, Saarland University, Saarbrucken, Saarland, Germany

Lasry, A., Kidder, D., Hast, M., Poovey, J., Sunshine, G., Zviedrite, N., Ahmed, F. and Ethier, K.A., (2020). “Timing of Community Mitigation And Changes in Reported COVID-19 And Community Mobility—Four US metropolitan Areas.” *Morbidity and Mortality Weekly Report*, 69(15): 451-457.

Lazzerini, M., Barbi, E., Apicella, A., Marchetti, F., Cardinale, F. and Trobia, G. (2020). “Delayed Access or Provision of Care in Italy Resulting From Fear of COVID-19.” *The Lancet Child & Adolescent Health*, 4(5), pp.e10-e11.

Millhiser, I. (2020, May 5). “A Republican Lawsuit Could Force Wisconsin to Reopen Immediately.” *Vox*.

Newsday Staff. (2020, May 22). “Cuomo: Long Island and Mid-Hudson Regions On Track to Begin Reopening Soon” *Newsday*. Retrieved from: https://www.newsday.com/news/health/coronavirus/coronavirus-long-island-new-york-1.44850649

New York Forward. (2020). “Metrics to Guide Reopening New York” Retrieved from: https://forward.ny.gov/metrics-guide-reopening-new-york

Office of the Governor, State of Wisconsin. (2020). Safer At Home FAQs. Retrieved from: https://content.govdelivery.com/attachments/WIGOV/2020/05/11/file_attachments/1447956/2020-05-11%20Safer%20at%20Home%20FAQ%20FINAL.pdf

O’Kane, C. (2020, May 15). Wisconsin bars packed with patrons almost immediately after court strikes down stay-at-home order. *CBS News*.

Oregon Health Authority. (2020). “Building a Safe and Strong Oregon | Reopening Criteria” Retrieved from: https://govstatus.egov.com/OR-OHA-Reopening-Framework

Richmond, T. (2020, May 18). “Evers Gives Up On Virus Restrictions Amidst GOP Opposition.” *AP Wire Service.*

Ruthhart, B. (2020, May 14). “Wisconsin Now Without COVID-19 Restrictions After State Supreme Court Strikes Down Gov. Tony Evers’ Stay-At-Home Order.” *Chicago Tribune*.

Santioli, J.M., Lindley, M.C., DeSilva, M.B., Kharbanda, E.O., Daley, M.F., Galloway, L., Gee, J, Glover, M., Herring, B., Kang, Y., Lucas, P., Noblit, C., Tropper, J., Vogt, T., and Weintraub, E. (2020) “Effects of the COVID-19 Pandemic on Routine Pediatric Vaccine Ordering and Administration.” *Morbidity and Mortality Weekly Report,* 69(19):591-593.

Schmidt, M. (2020, May 16). “Some Wisconsin Counties Rescind Local Stay-At-Home Orders, Dane County Order to Stay in Place.” *Wisconsin State Journal*.

Simonov, A., Sacher, S., Dubé, J.P. and Biswas, S. (2020). “The Persuasive Effect of Fox News: Non-Compliance with Social Distancing During the Covid-19 Pandemic.” *NBER Working Paper No. 27237.*

State of Wisconsin, Department of Health Services. (2020, March 24). “Emergency Order #12: Safer at Home Order.” Retrieved from: https://evers.wi.gov/Documents/COVID19/EMO12-SaferAtHome.pdf

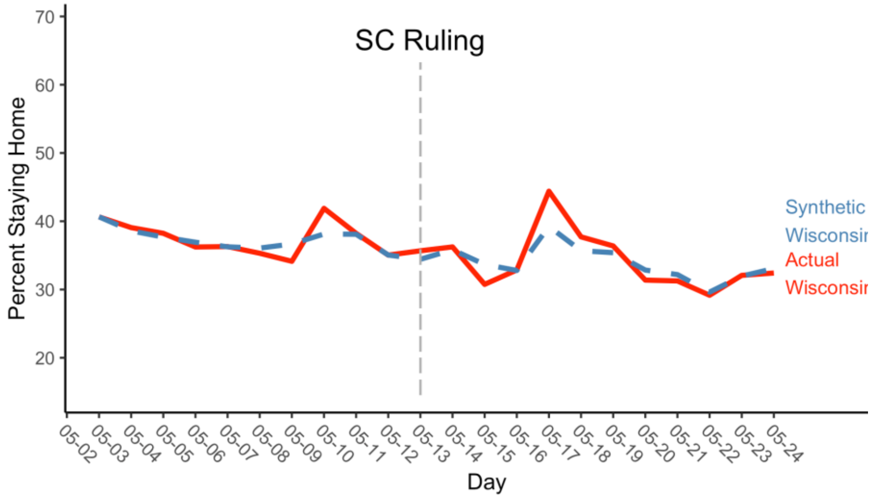
State of Wisconsin, Department of Health Services. (2020, April 16). “Emergency Order #28: Safer at Home Order.” Retrieved from: https://evers.wi.gov/Documents/COVID19/EMO28-SaferAtHome.pdf

Usero, A. (2020, May 27) “Reopening Too soon: Lessons From the Deadly Second Wave of the 1918 Flu Pandemic.” *Washington Post.*

Vainshtein, A. (2020, May 1). “Save the Economy or Save Lives: Bay Area Residents Debate Morality of Shelter In Place.” *San Francisco Chronicle.*
Vetterkind, R. (2020, May 14). “Wisconsin Supreme Court Strikes Down Stay-At-Home Order; Dane County Institutes Local Order.” *Wisconsin State Journal*.
Wisconsin Department of Health Services. (2020). “Outbreaks in Wisconsin: COVID-19 (Coronavirus Disease 2019): Wisconsin Data.” Retrieved from: https://www.dhs.wisconsin.gov/outbreaks/index.htm
Wisconsin Legislature v. Palm, 2020AP765-OA (Wisconsin Supreme Court 2020).
WisContext Staff. (2020, May 15). “What the COVID-19 Pandemic Looks Like in Wisconsin: Maps and Charts.” *Wiscontext*.
Whitehouse. (2020). “Guidelines for Opening up America Again” Retrieved from: https://www.whitehouse.gov/openingamerica/

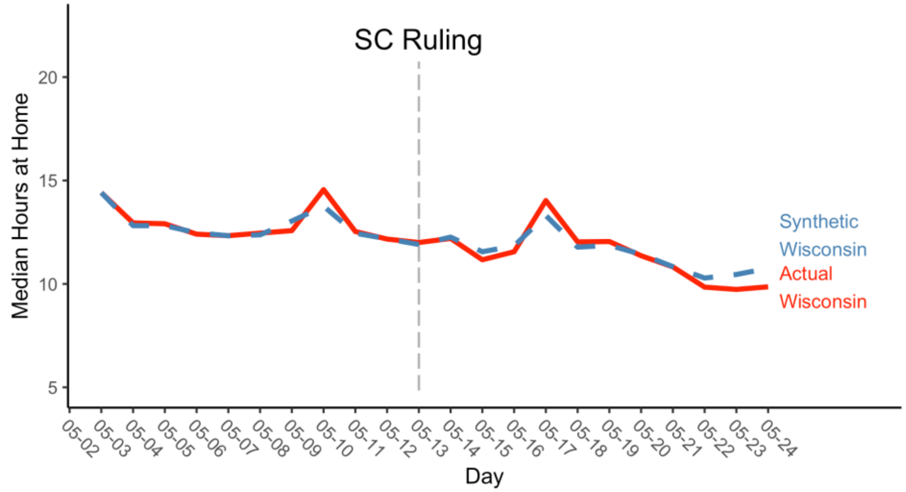
Figure 1. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on Social Distancing

Panel (a): Percent at Home Full-Time



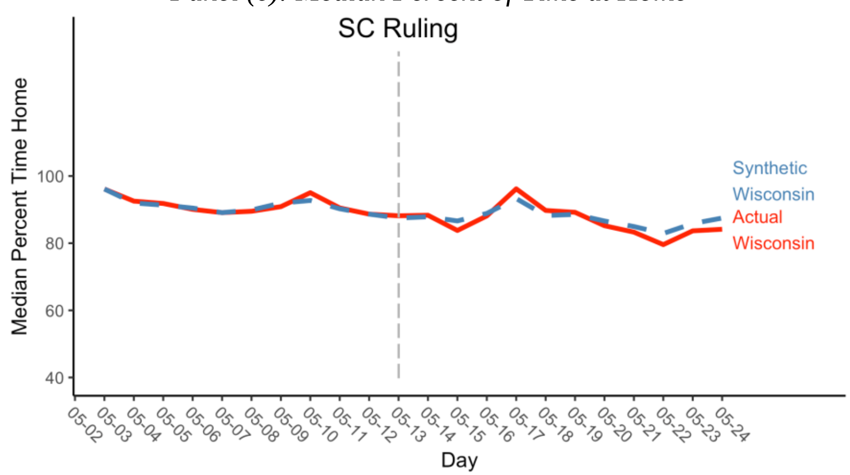
Note: Synthetic WI is comprised of MI (.262), LA (.223), ME (.131), NH (.128), HI (.046), NM (.033), OH (.033), IL (.028), PA (.021), VA (.02), DE (.018), & OR (.015)

Panel (b): Median Hours at Home



Note: Synthetic WI is comprised of MI (.484), NM (.245), ME (.154), & OH (.049)

Panel (c): Median Percent of Time at Home

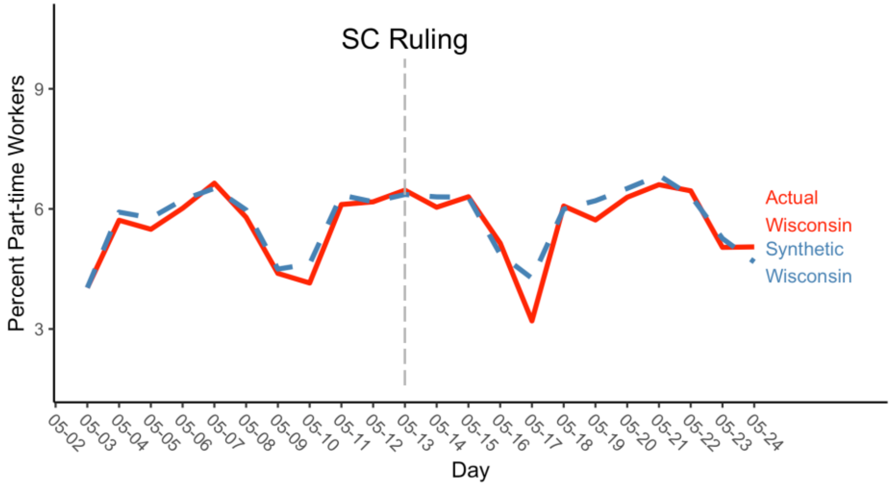


Note: Synthetic WI is comprised of ME (.195), LA (.169), OH (.149), NM (.071), NH (.067), VA (.052), MI (.045), PA (.038), DE (.035), IL (.032), OR (.032), WA (.03), HI (.027), NY (.017), CA (.016), & DC (.015)

Notes: Estimate is generated using synthetic control methods. The matching was based on urbanicity and three days of pre-SIPO expiration social distancing measures.

Figure 1. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on Social Distancing

Panel (d): Part-Time Work



Note: Synthetic WI is comprised of ME (.28), NM (.214), CA (.107), PA (.043), NH (.042), NY (.039), OR (.028), WA (.037), MI (.036), DC (.034), VA (.027), NJ (.024), OH (.024), IL (.023), & DE (.021

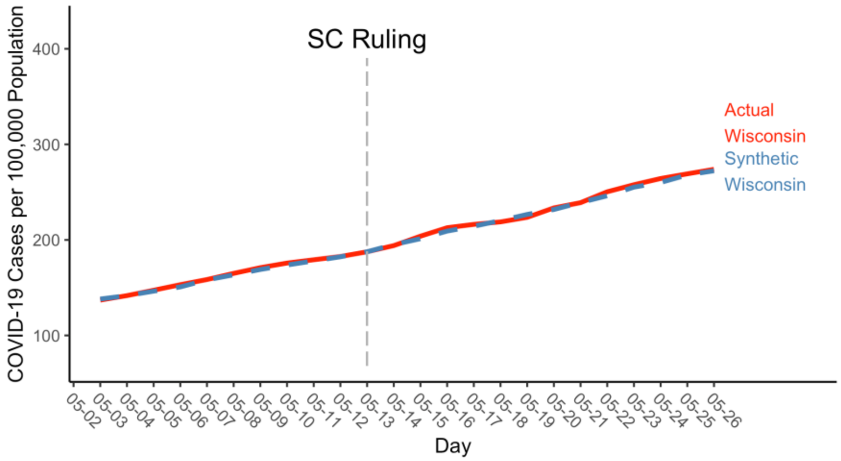
Panel (e): Full-Time Work

Note: Synthetic WI is comprised of NH (.485), NM (.22), IL (.184), & MEE (.097)

Notes: Estimate is generated using synthetic control methods. The matching was based on urbanicity and three days of pre-SIPO expiration social distancing measures.

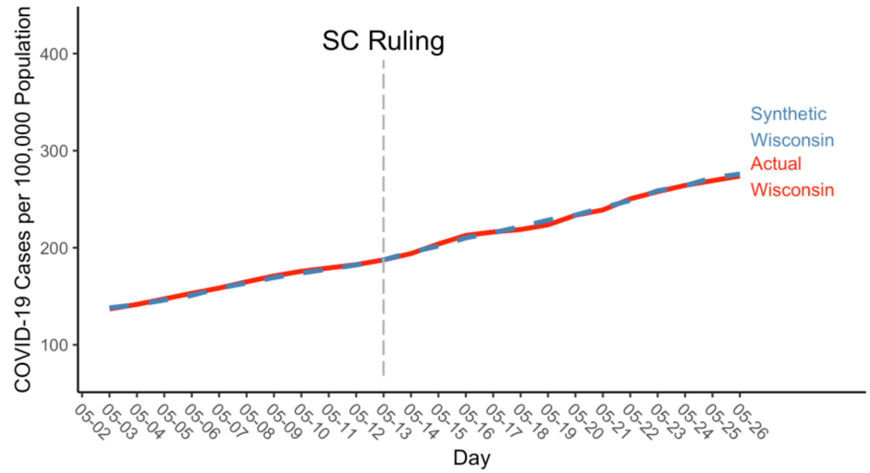
Figure 2. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on COVID-19 Cases

Panel (a): Matching on Urbanicity & 3 Days of Pre-Treatment Cases



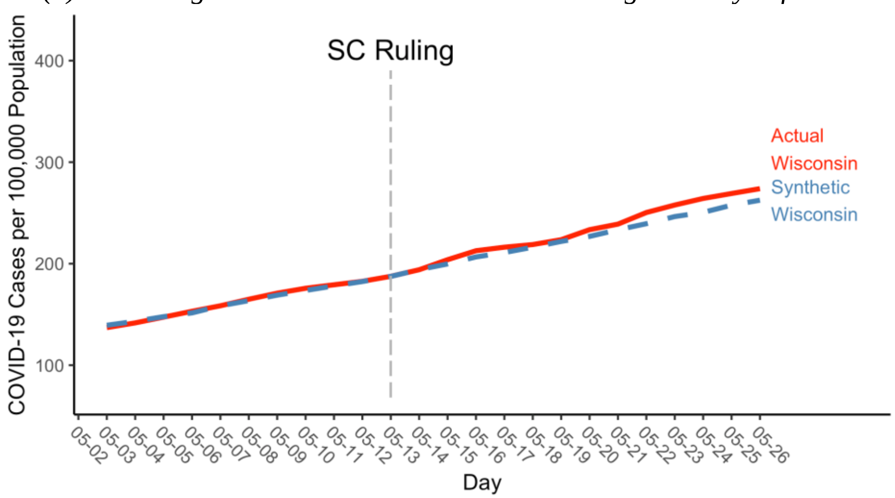
Note: Synthetic WI is comprised of NC (.681), VA (.127), OR (.092), NM (.041), and CA (.015).

Panel (b): Matching on Testing Rate & 3 Days of Pre-Treatment Cases



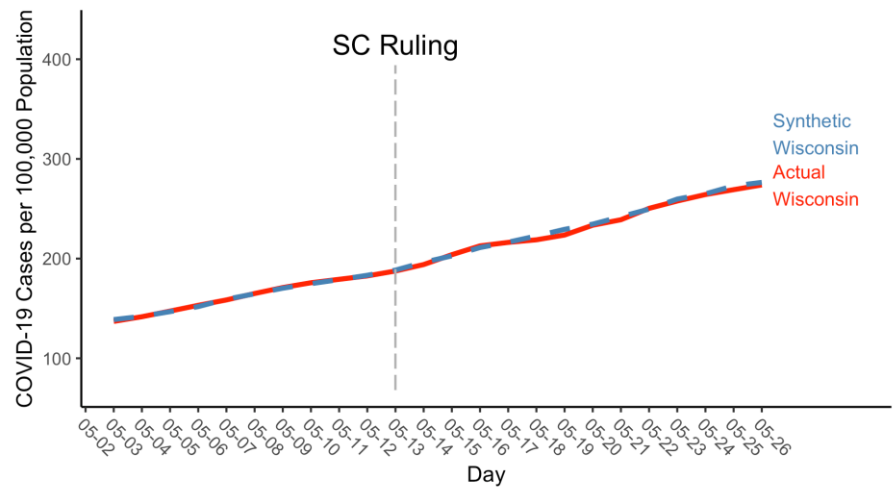
Note: Synthetic WI is comprised of NC (.788), VA (.106), NM (.032), and CA (.015).

Panel (b): Matching on Pre-Treatment Social Distancing & 3 Days of Cases



Note: Synthetic WI is comprised of NC (.416), OR (.279), VA (.177), and NM (.028).

Panel (d): Matching on Each Day of Pre-Treatment Cases

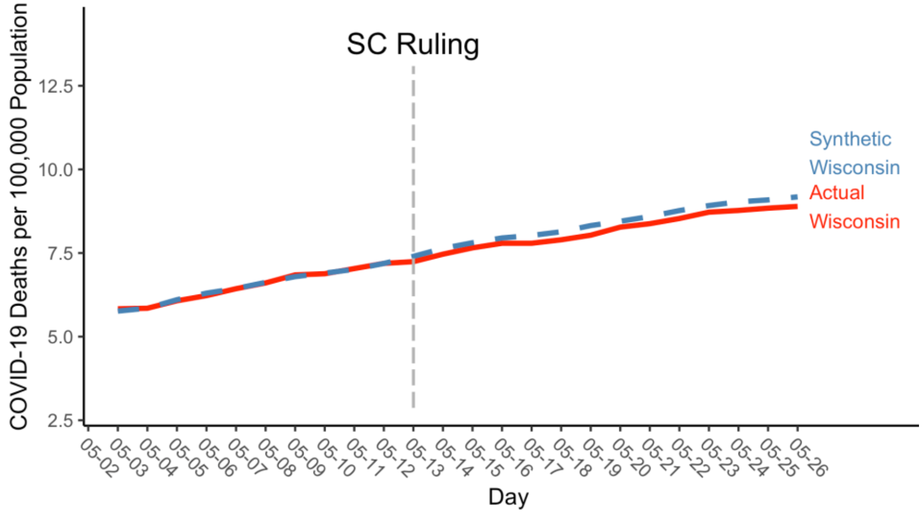


Note: Synthetic WI is comprised of NC (.824), VA (.069), NM (.04), and CA (.015).

Notes: Estimate is generated using synthetic control methods.

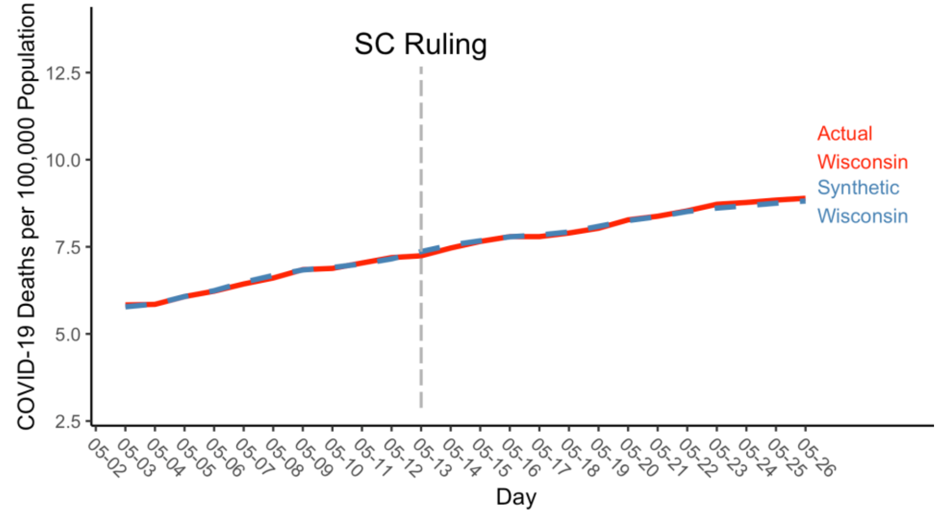
Figure 3. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on COVID-19 Deaths

Panel (a): Matching on Urbanicity & 3 Days of Pre-Treatment Deaths



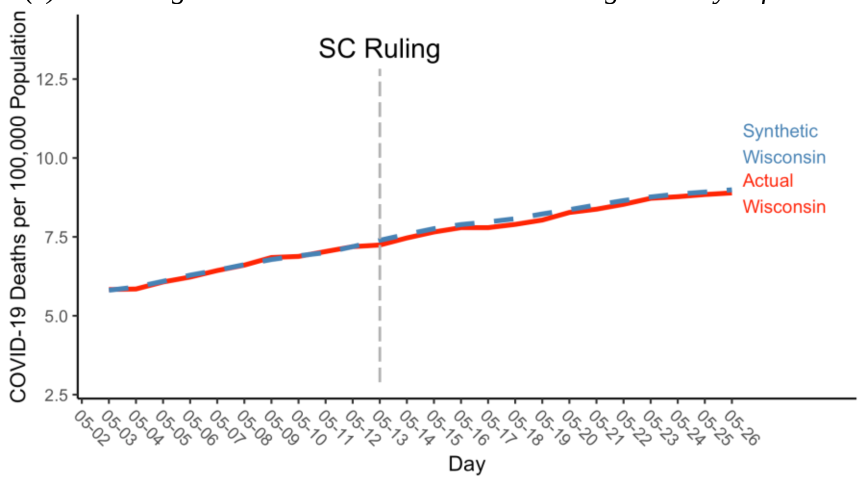
Note: Synthetic WI is comprised of HI (.344), ME (.326), NM (.128), NC (.029), OR (.02), VA (.019), OH (.017), & WA (.015)

Panel (b): Matching on Testing Rate & 3 Days of Pre-Treatment Deaths



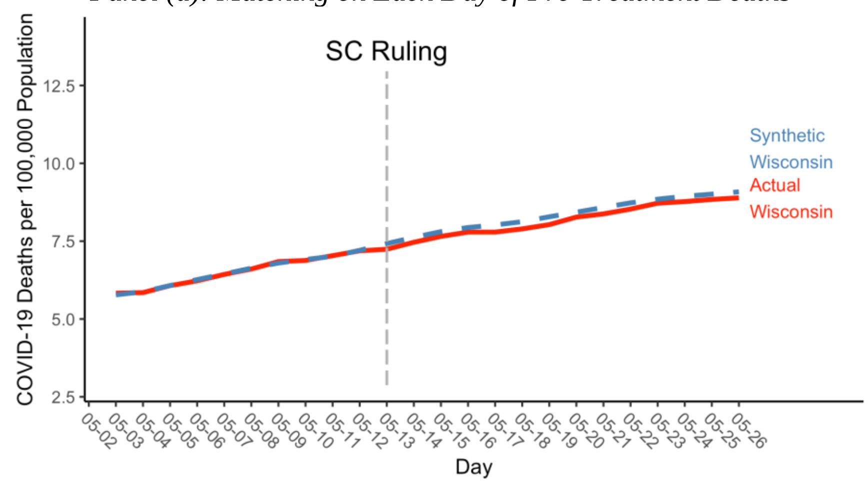
Note: Synthetic WI is comprised of OR (.63), ME (.105), VA (.079), HI (.037), NC (.019), CA (.018), & DE (.015)

Panel (c): Matching on Pre-Treatment Social Distancing & 3 Days of Deaths



Note: Synthetic WI is comprised of HI (.63), NM (.125), ME (.033), OR (.031), WA (.022),

Panel (d): Matching on Each Day of Pre-Treatment Deaths

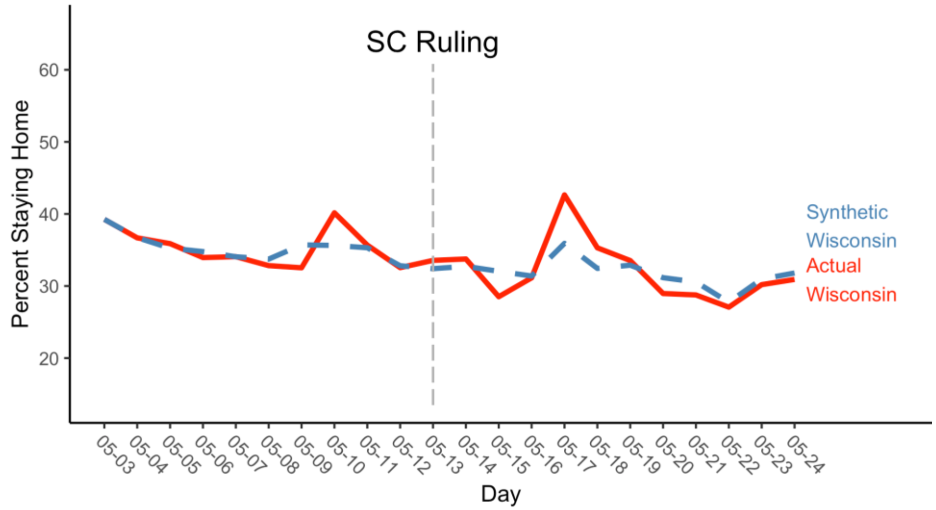


Note: Synthetic WI is comprised of HI (.567), NM (.113), OR (.085), ME (.03), VA (.029), CA (.027), NC (.025), WA (.02), OH (.018), DE (.017)

Notes: Estimate is generated using synthetic control methods.

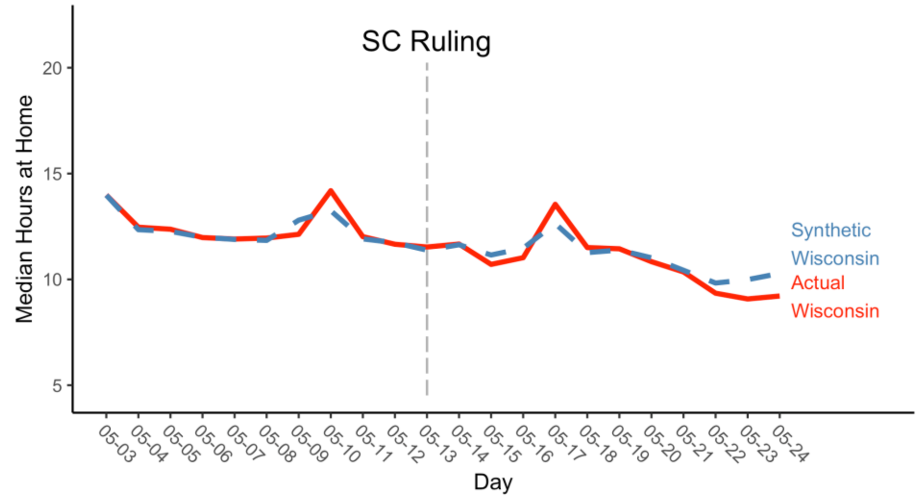
Figure 4. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on Social Distancing for Bound Wisconsin

Panel (a): Percent at Home Full-Time



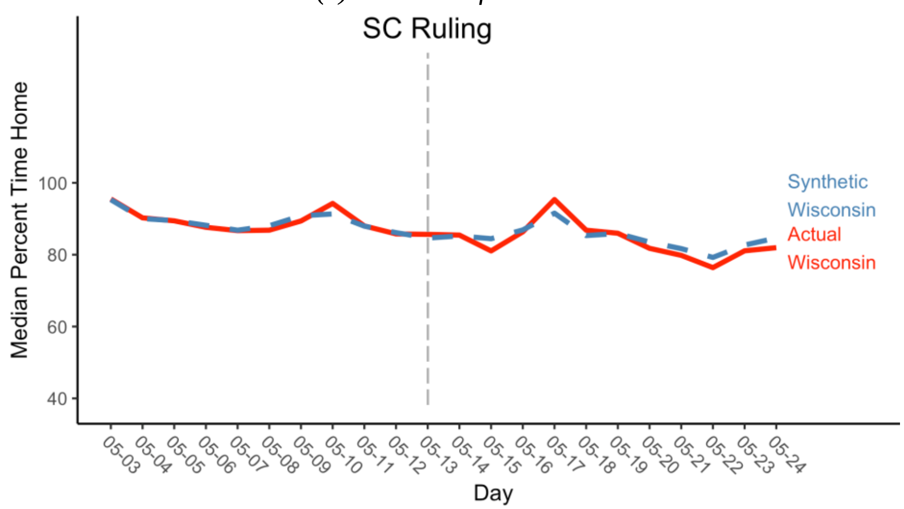
Note: Synthetic WI is comprised of ME (.423), LA (.33), MI (.034), HI (.02), NM (.028), OH (.027), NH (.02), VA (.018), IL (.017), & PA (.015).

Panel (b): Median Hours at Home



Note: Synthetic WI is comprised of ME (.419), MI (.331), NM (.191), & OH (.05).

Panel (c): Percent of Time at Home

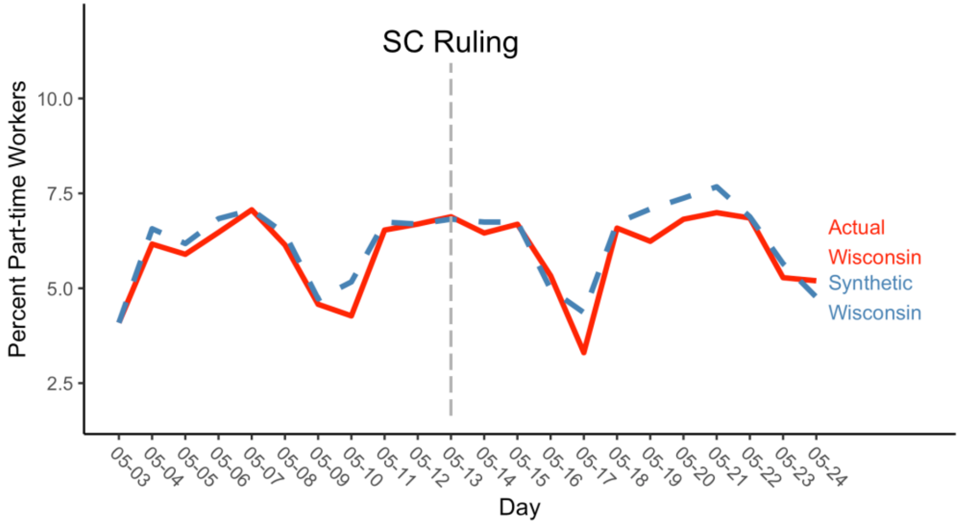


Note: Synthetic WI is comprised of ME (.412), OH (.336), & LA (.245).

Notes: Estimate is generated using synthetic control methods. The matching was based on urbanicity and three days of pre-SIPO expiration social distancing measures.

Figure 4. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on Social Distancing for Bound Wisconsin

Panel (d): Part-Time Work



Note: Synthetic WI is comprised of ME (.452), LA (.209), NM (.10), HI (.066), NH (.027), MI (.017), OH (.017), VA (.017), & OR (.015)

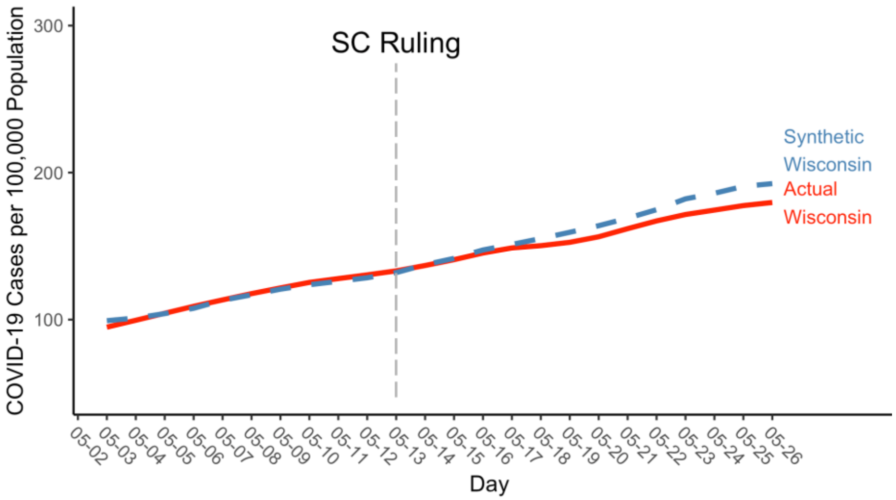
Panel (e): Full-Time Work

Note: Synthetic WI is comprised of NH (.805) & ME (.195).

Notes: Estimate is generated using synthetic control methods. The matching was based on urbanicity and three days of pre-SIPO expiration social distancing measures.

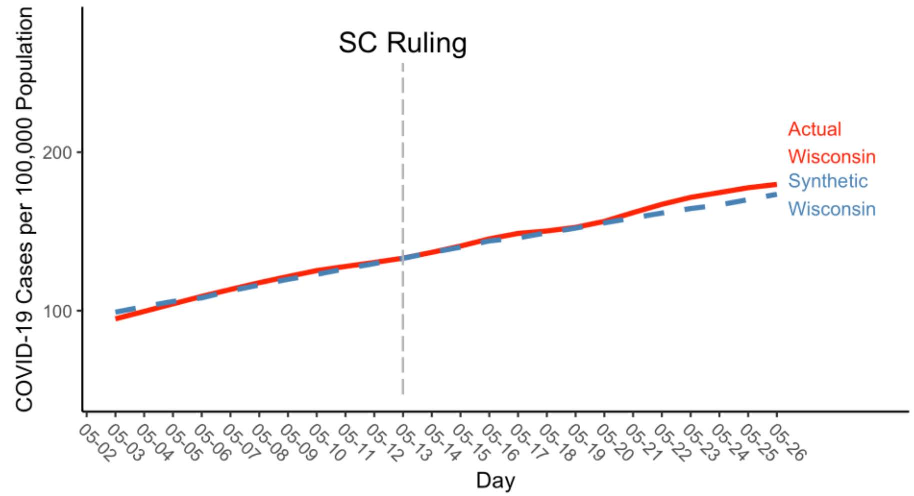
Figure 5. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on COVID-19 Cases for Bound Wisconsin

Panel (a): Matching on Urbanicity & 3 Days of Pre-Treatment Cases



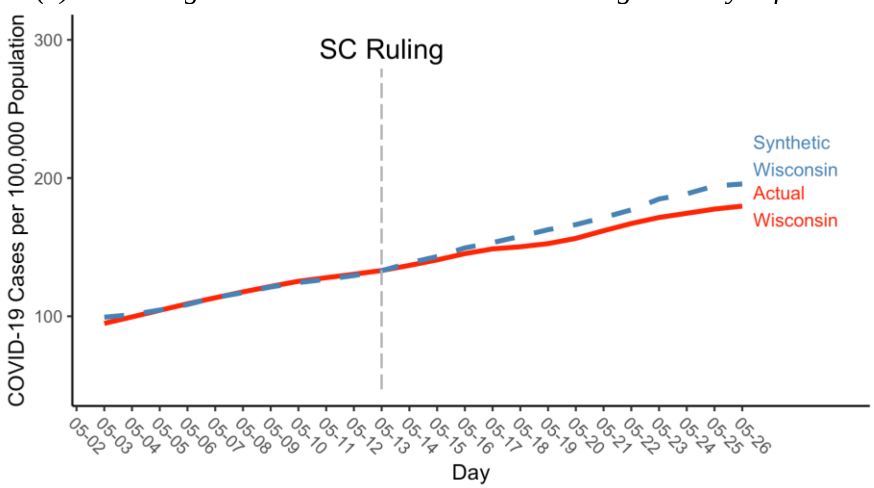
Note: Synthetic WI is comprised of NC (.568), ME (.287), & OR (.141)

Panel (b): Matching on Testing Rate & 3 Days of Pre-Treatment Cases



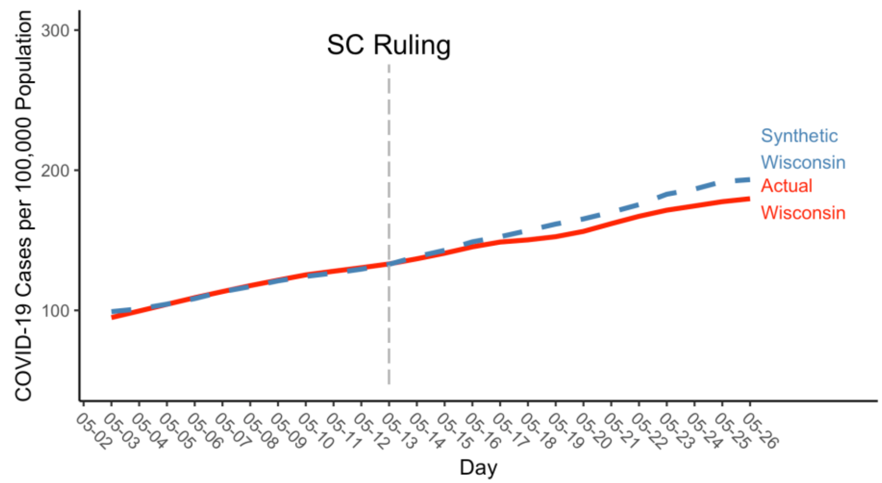
Note: Synthetic WI is comprised of OR (.733), VA (.13), NM (.087), & NC (.036).

Panel (b): Matching on Pre-Treatment Social Distancing & 3 Days of Cases



Note: Synthetic WI is comprised of NC (.748), OR (.184) & HI (.065).

Panel (d): Matching on Each Day of Pre-Treatment Cases

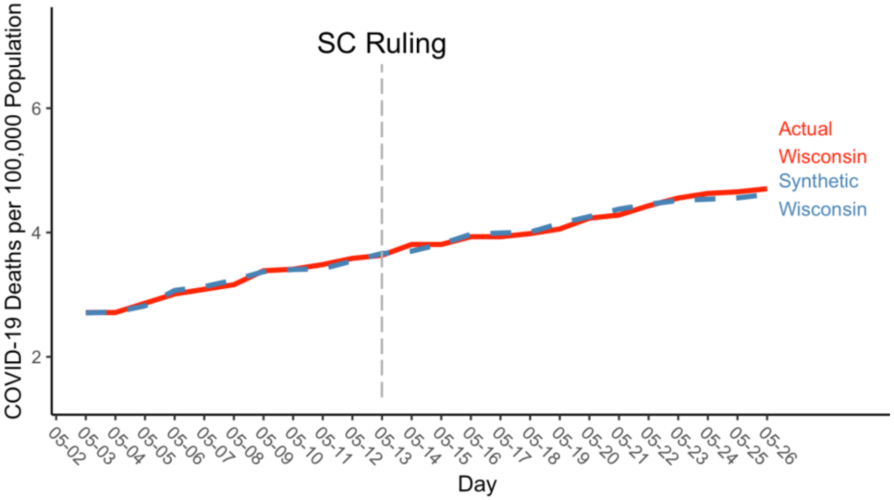


Note: Synthetic WI is comprised of NC (.695) & OR (.297).

Notes: Estimate is generated using synthetic control methods.

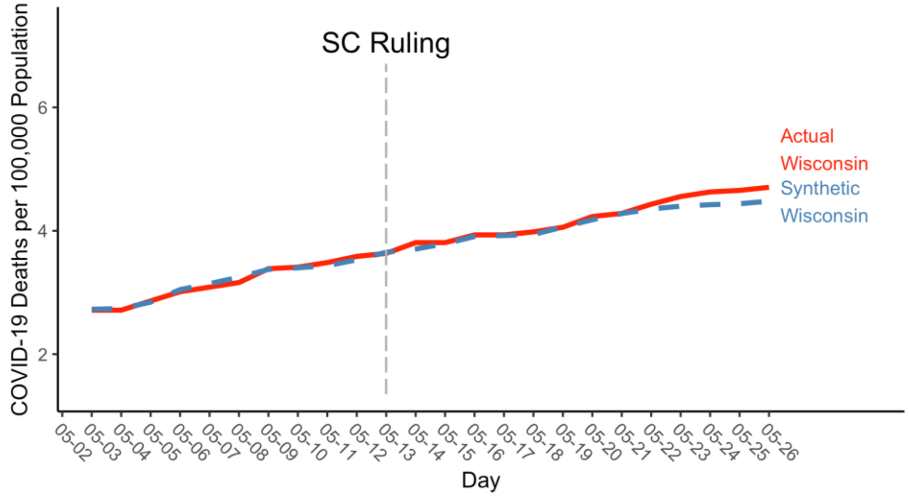
Figure 6. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on COVID-19 Deaths

Panel (a): Matching on Urbanicity & 3 Days of Pre-Treatment Deaths



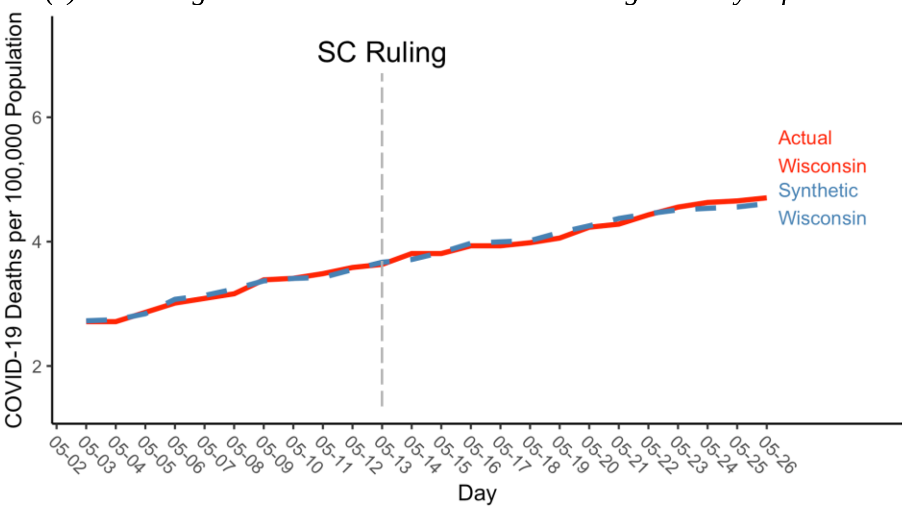
Note: Synthetic WI is comprised of HI (.783) & NM (.157)

Panel (b): Matching on Testing Rate & 3 Days of Pre-Treatment Deaths



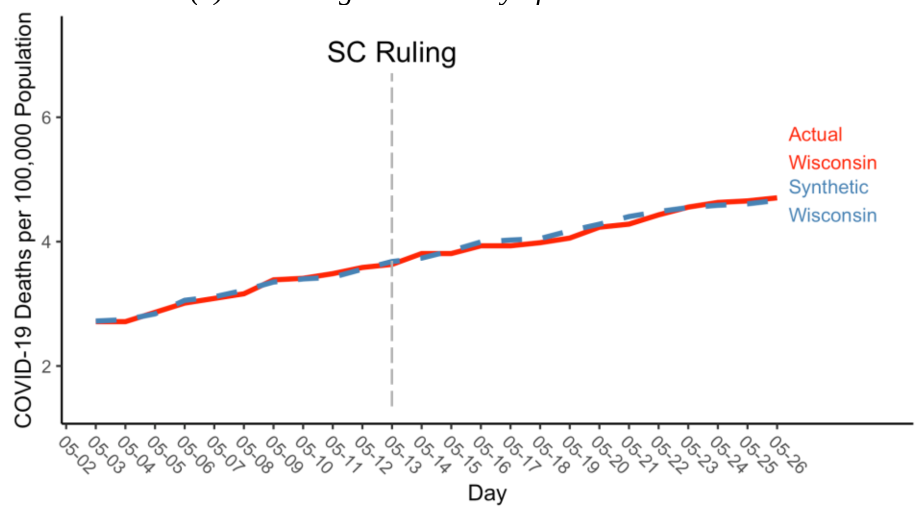
Note: Synthetic WI is comprised of HI (.476), OR (.371), & NH (.12).

Panel (c): Matching on Pre-Treatment Social Distancing & 3 Days of Deaths



Note: Synthetic WI is comprised of HI (.794), NH (.141) & NM (.015)

Panel (d): Matching on Each Day of Pre-Treatment Deaths



Note: Synthetic WI is comprised of HI (.79), NH (.127), & NM (05).

Notes: Estimate is generated using synthetic control methods.

Table 1. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on Social Distancing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel I: % Percent at Home Full-Time				
SIPO	0.298	0.590	0.320	0.590	0.528	-0.429	-0.699	-0.762
P-Value	[0.556]	[0.444]	[0.500]	[0.556]	[0.556]	[0.500]	[0.583]	[0.778]
				Panel II: Median Hours at Home				
SIPO	-0.135	-0.248	-0.142	-0.042	-0.395	-0.060	-0.504	-0.490
P-Value	[0.444]	[0.333]	[0.389]	[0.667]	[0.222]	[0.611]	[0.333]	[0.389]
				Panel III: Percent of Time at Home				
SIPO	-0.776	-0.791	-0.869	-0.866	-0.681	-0.709	-1.376	-1.225
P-Value	[0.278]	[0.278]	[0.389]	[0.389]	[0.389]	[0.278]	[0.333]	[0.444]
				Panel IV: Part-Time Work				
SIPO	-0.126*	-0.113	-0.109	-0.175	-0.155	-0.092*	0.016	0.037
P-Value	[0.056]	[0.389]	[0.556]	[0.167]	[0.333]	[0.056]	[0.167]	[0.111]
				Panel V: % Full-Time Work				
SIPO	0.037	0.030	0.034	0.002	0.027	0.114	-0.022	0.022
P-Value	[0.222]	[0.389]	[0.278]	[0.333]	[0.444]	[0.278]	[0.833]	[0.778]
Donor Pool	Full Pool[a]	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool[b]	Full Pool
Observables for constructing weights:								
Days Pre-Treat Social Distance	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Other Reopening Policies	No	No	No	No	No	Yes	No	No

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

Notes: Estimate is generated using synthetic control methods. The matching was based off ten days of pre-SIPO expiration social distancing measures. The matching was based off pre-treatment social distancing and observables listed under each column. The permutation-based p-values are included in brackets below each point estimate.
[a]Donor states included CA, DC, DE, HI, IL, LA, ME, MI, NH, NC, NJ, NM, NY, OH, OR, PA, VA, and WA.
[b]For this specification, the donor pool is restricted to those states that had a SIPO over the entire sample period under study and had no reopening of restaurants or bars.

Table 2. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on COVID-19 Cases & Deaths

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel I: COVID-19 Cases per 100,000							
SIPO	1.260	-0.257	1.992	-0.734	6.504	-0.199	0.752	-1.611
P-Value	[0.941]	[1.000]	[0.882]	[1.000]	[0.588]	[1.000]	[0.923]	[0.882]
	Panel II: COVID-19 Deaths per 100,000							
SIPO	-0.216	-0.055	-0.127	0.005	-0.119	-0.168	-0.198	-0.183
P-Value	[0.158]	[0.526]	[0.368]	[0.842]	[0.579]	[0.368]	[0.400]	[0.474]
Donor Pool	Full Pool[a]	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool[b]	Full Pool
Observables for constructing weights:								
Days Pre-Treat Cases/Deaths	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat Social Distance	No	No	No	No	Yes	No	No	No
Other Reopening Policies	No	No	No	No	No	Yes	No	No

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

Notes: Estimate is generated using synthetic control methods. The matching was based off pre-treatment cases or deaths and observables listed under each column. The permutation-based p-values are included in brackets below each point estimate.

[a]Donor states included CA, DC, DE, HI, IL, LA, ME, MI, NH, NC, NJ, NM, NY, OH, OR, PA, VA, and WA.

[b]For this specification, the donor pool is restricted to those states that had a SIPO over the entire sample period under study and had no reopening of restaurants or bars.

Table 3. Exploring Heterogeneity in Effect of SIPO Expiration

	(1) % Staying at Home	(2) Median % Time Home	(3) Median Hours at Home	(4) % Part Time Workers	(5) % Full Time Workers	(6) Log(Cases)	(7) Log(Deaths)
	Panel I: Overall						
WI Supreme Court SIPO Ruling	0.308	-0.935	-0.203	-0.005	0.059	-0.026	-0.005
Permutation-based [p-value]	[.944]	[.777]	[.856]	[1.000]	[.800]	[.764]	[.947]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{17/18}	{14/18}	{6/7}	{17/17}	{4/5}	{13/17}	{18/19}
	Panel II: Mitigating Local Order						
WI Supreme Court SIPO Ruling * WI County Fully Bound	0.293	-1.536	-0.271	0.008	0.043	-0.016	-0.110
Permutation-based [p-value]	[.944]	[.888]	[0.428]	[.824]	[.800]	[.824]	[.632]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{17/18}	{16/18}	{3/7}	{14/17}	{4/5}	{14/17}	{12/19}
WI Supreme Court SIPO Ruling * WI County Mitigating Order	0.325	-0.323	-0.133	-0.019	0.075	-0.036	0.065
Permutation-based [p-value]	[.940]	[.587]	[1.000]	[1.000]	[.600]	[.875]	[.555]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{16/17}	{10/17}	{7/7}	{16/16}	{3/5}	{14/16}	{10/18}
	Panel III: Current Local Order						
WI Supreme Court SIPO Ruling * WI County w/o Current Order	0.257	-1.348	-0.265	0.020	0.042	-0.006	0.018
Permutation-based [p-value]	[0.944]	[1.000]	[.261]	[.412]	[.800]	[1.000]	[.788]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{17/18}	{18/18}	{2/7}	{7/17}	{4/5}	{16/16}	{15/19}
WI Supreme Court SIPO Ruling * WI County with Current Order	0.443	0.153	-0.040	-0.073	0.103	-0.079	-0.049
Permutation-based [p-value]	[1.000]	[.705]	[1.000]	[.938]	[.600]	[.412]	[.944]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{17/17}	{12/17}	{7/7}	{15/16}	{3/5}	{7/15}	{17/18}
	Panel IV: County Urbanicity						
WI Supreme Court SIPO Ruling * ≥ 50% Urbanicity	0.213	-0.762	-0.236	-0.009	0.060	-0.039	0.008
Permutation-based [p-value]	[.944]	[.833]	[.856]	[.940]	[.800]	[.705]	[.947]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{17/18}	{15/18}	{6/7}	{16/17}	{4/5}	{12/17}	{18/19}
WI Supreme Court SIPO Ruling* < 50% Urbanicity	0.659	-1.571	-0.081	0.007	0.054	0.024	-0.111
Permutation-based [p-value]	[.713]	[.428]	[.570]	[.922]	[.600]	[.786]	[.286]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{10/14}	{6/14}	{4/7}	{12/13}	{3/5}	{11/14}	{4/14}

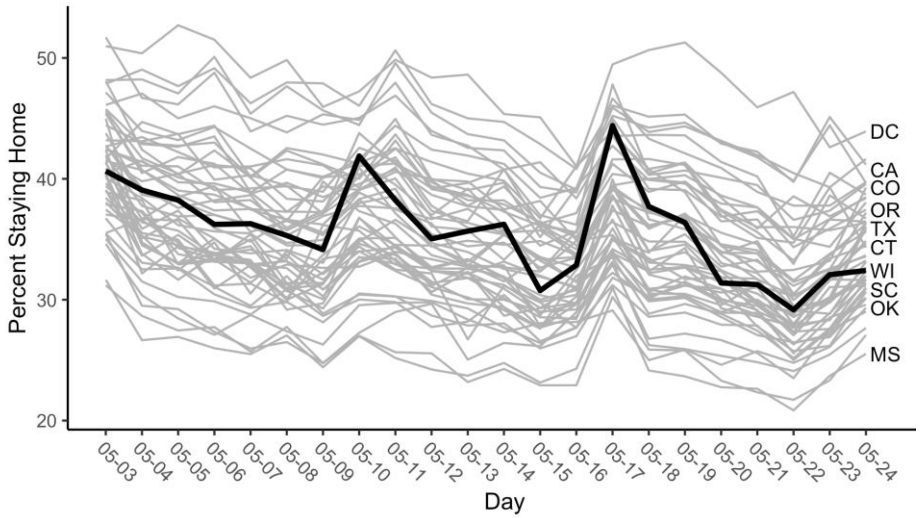
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	% Staying at Home	Median % Time Home	Median Hours at Home	% Part Time Workers	% Full Time Workers	Log(Cases)	Log(Deaths)
	Panel V: County Population Density						
WI Supreme Court SIPO Ruling * ≥ 75 people per sq. mi	0.173	-0.743	-0.241	-0.013	0.060	-0.029	0.011
Permutation-based [p-value]	[.944]	[.777]	[.570]	[.940]	[.800]	[.764]	[.842]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{17/18}	{14/18}	{4/7}	{16/17}	{4/5}	{13/17}	{16/19}
WI Supreme Court SIPO Ruling* <75 people per sq. mi	0.765	-1.585	-0.074	0.022	0.054	-0.017	-0.125
Permutation-based [p-value]	[.666]	[.600]	[.856]	[1.000]	[1.000]	[.856]	[.266]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{10/15}	{9/15}	{6/7}	{14/14}	{5/5}	{12/14}	{4/15}
	Panel VI: County % Voted for Trump						
WI Supreme Court SIPO Ruling * ≥50% Voted for Trump	0.111	-1.511	-0.342	0.039	0.056	-0.007	0.043
Permutation-based [p-value]	[1.000]	[0.500]	[.286]	[.800]	[1.000]	[.938]	[.75]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{16/16}	{8/16}	{2/7}	{12/16}	{5/5}	{15/16}	{12/16}
WI Supreme Court SIPO Ruling* <50% Voted for Trump	0.515	-0.330	-0.057	-0.052	0.062	-0.046	-0.047
Permutation-based [p-value]	[.875]	[0.875]	[1.000]	[.666]	[.800]	[.688]	[.688]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{14/16}	{14/16}	{7/7}	{10/15}	{4/5}	{11/16}	{11/16}
Mean of Dependent Variable	38.972	93.002	12.235	5.244	3.289	5.198	2.603
N	17776	19624	8052	18216	5126	18885	15471

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

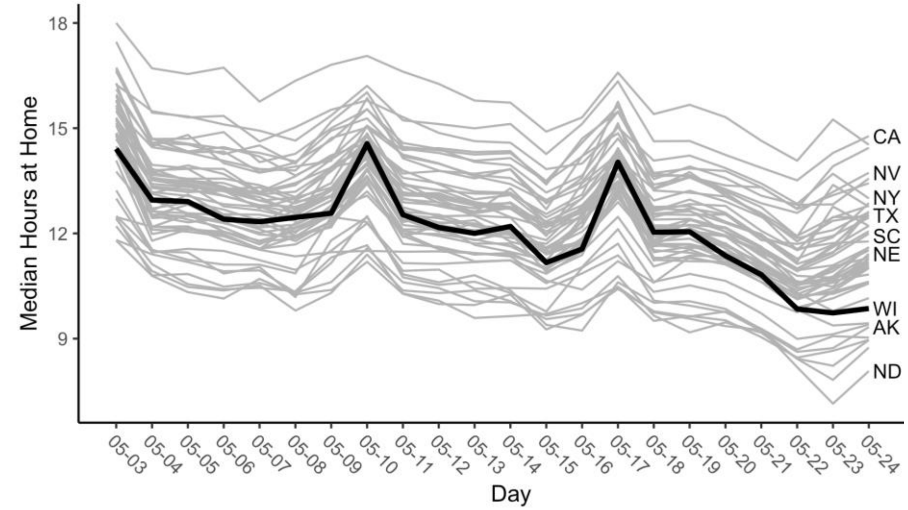
Notes: Regressions include Wisconsin and each donor state that included positive weights greater than 0.01. The weights are generated by multiplying share of state population by the synthetic weights. All estimates include: an indicator for whether retail store and restaurant or bar reopened, an indicator for whether personal or pet care services reopened, an indicator for whether entertainment and physical activity facilities reopened, log testing, county and day fixed effects. P-values, generated using permutation test, are reported inside brackets.

Appendix Figure 1: Trends in Social Distancing

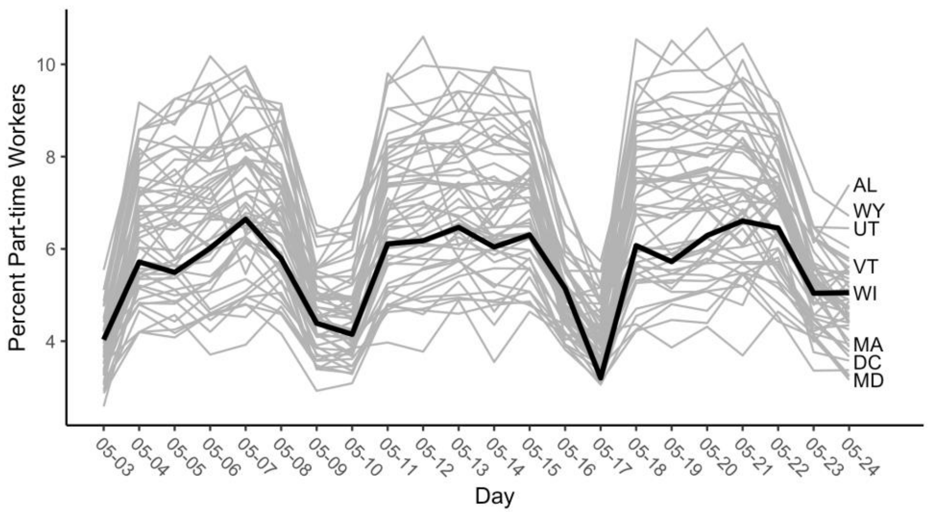
Panel (a): Percent at Home Full-Time



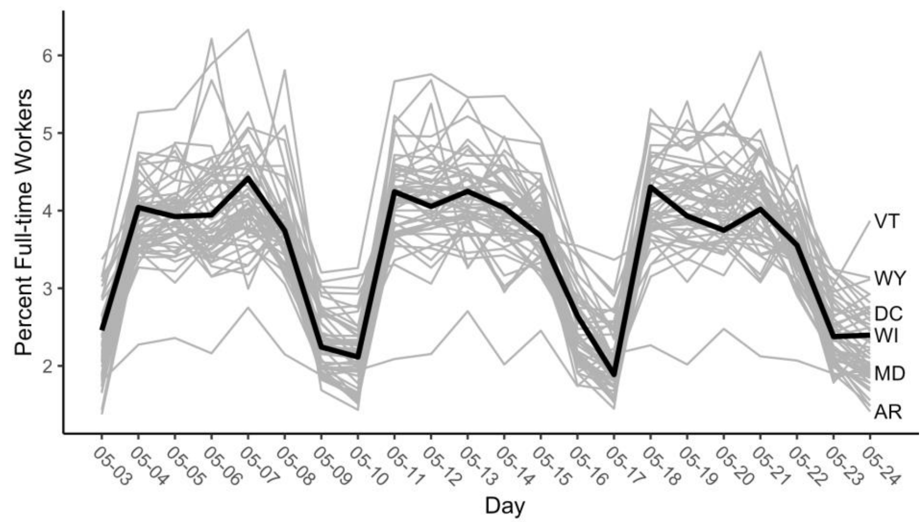
Panel (b): Median Hours at Home



Panel (c): Part-Time Work

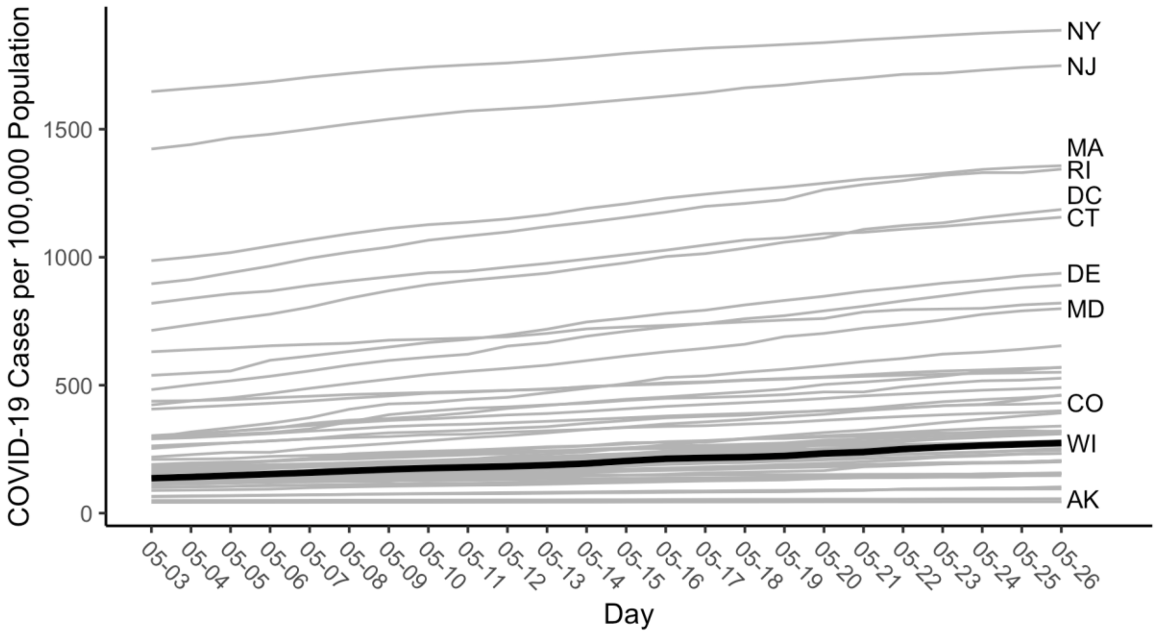


Panel (d): Full-Time Work

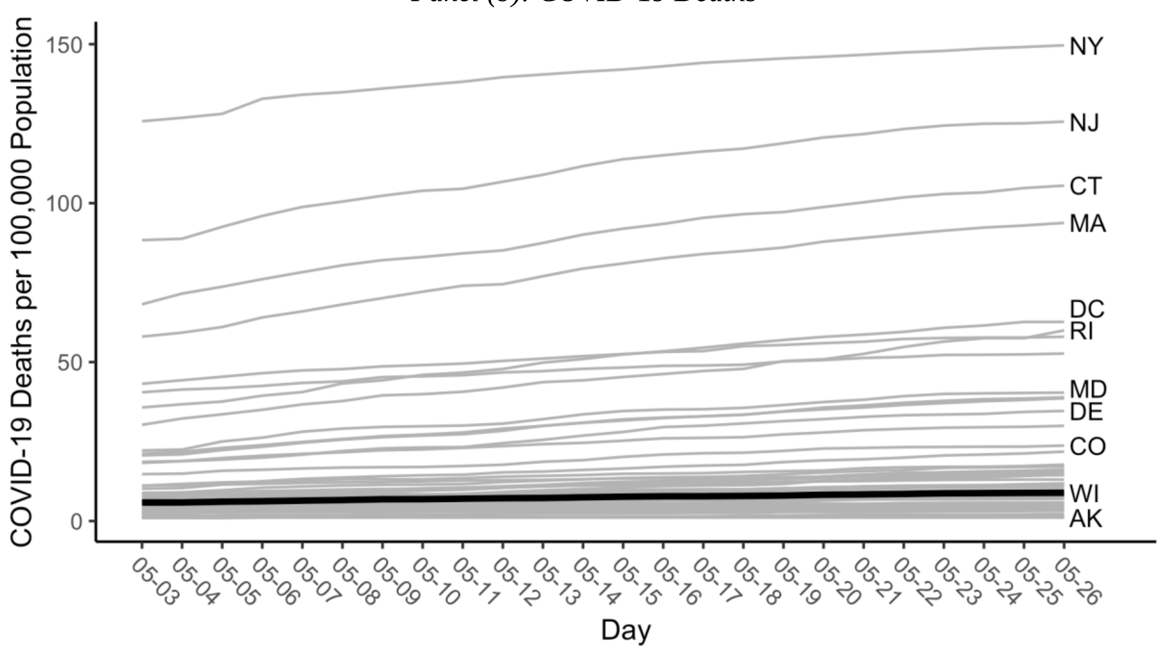


Appendix Figure 2: Trends in COVID-19 Cases and Deaths by State

Panel (a): COVID-19 Cases

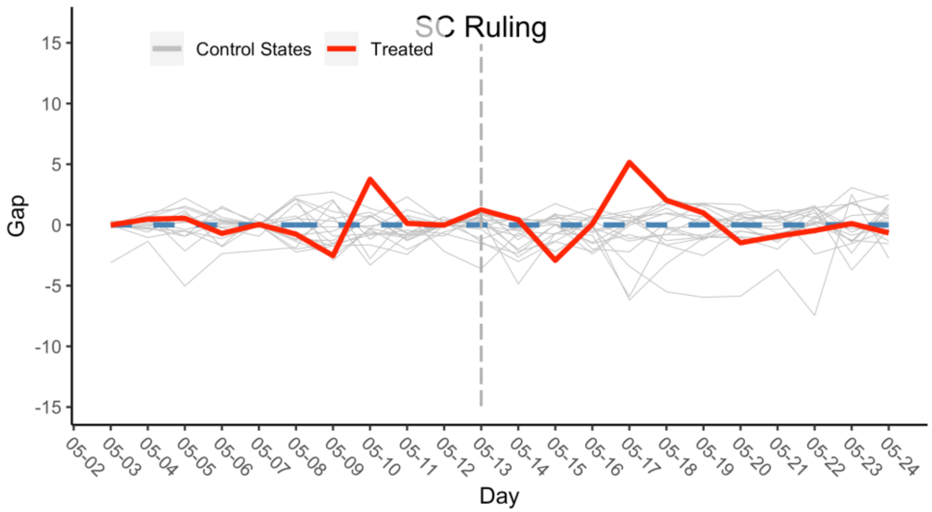


Panel (b): COVID-19 Deaths



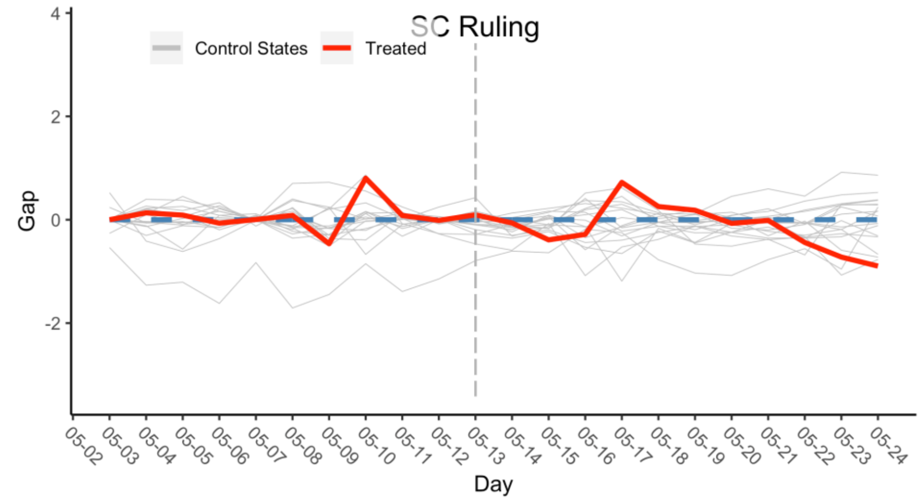
Appendix Figure 3. Placebo Tests for Social Distancing

Panel (a): Percent at Home Full-Time



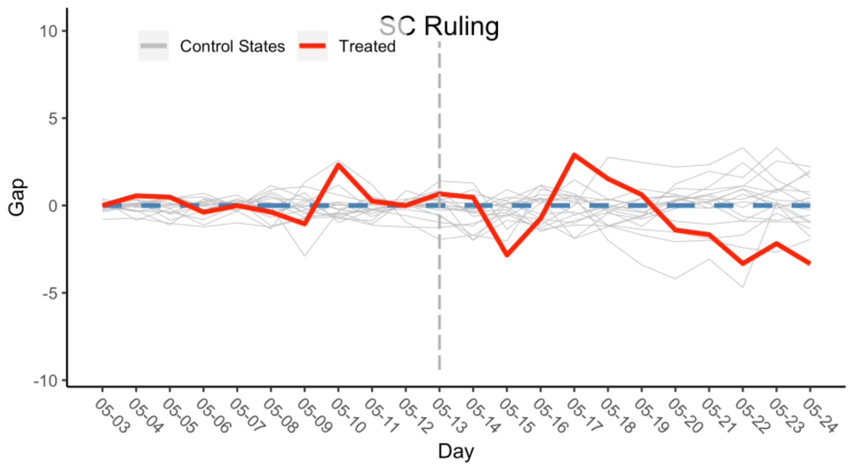
Note: Synthetic WI is comprised of MI (.262), LA (.223), ME (.131), NH (.128), HI (.046), NM (.033), OH (.033), IL (.028), PA (.021), VA (.02), DE (.018), & OR (.015)

Panel (b): Median Hours at Home



Note: Synthetic WI is comprised of MI (.484), NM (.245), ME (.154), & OH (.049)

Panel (c): Percent of Time at Home

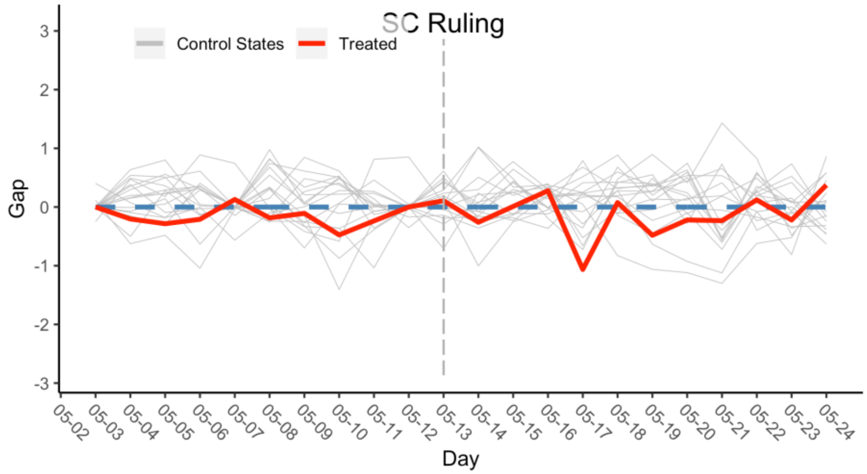


Note: Synthetic WI is comprised of MI (.484), NM (.245), ME (.154), & OH (.049)

Notes: Estimate is generated using synthetic control methods. The matching was based on urbanicity and three days of pre-SIPO expiration social distancing measures.

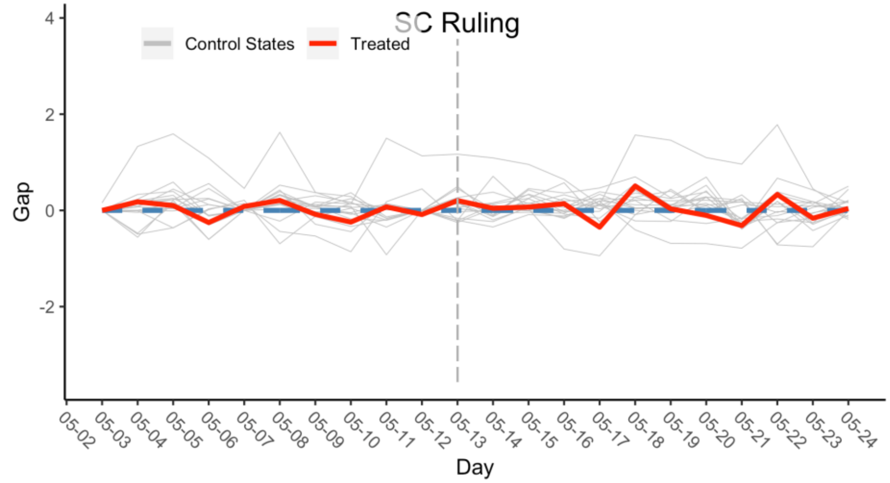
Appendix Figure 3. Placebo Tests for Social Distancing

Panel (d): Part-Time Work



Note: Synthetic WI is comprised of ME (.28), NM (.214), CA (.107), PA (.043), NH (.042), NY (.039), OR (.028), WA (.037), MI (.036), DC (.034), VA (.027), NJ (.024), OH (.024), IL (.023), & DE (.021

Panel (e): Full-Time Work

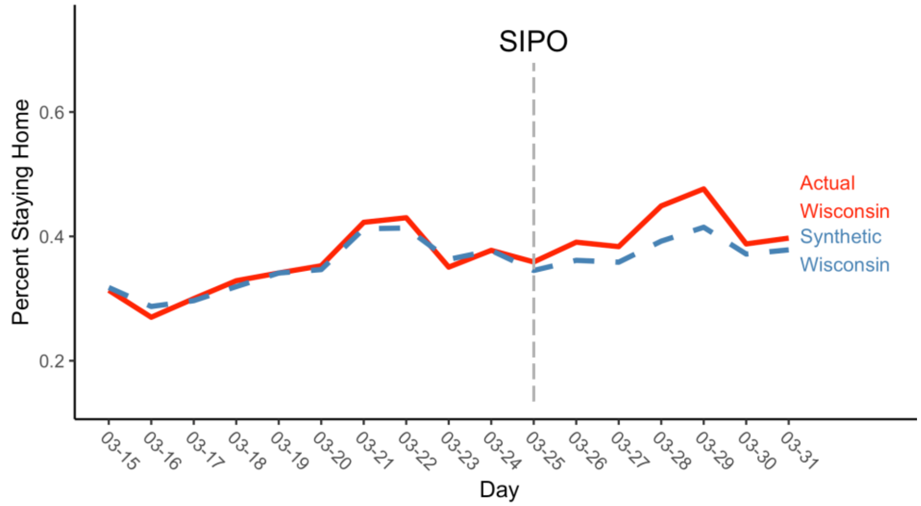


Note: Synthetic WI is comprised of NH (.485), NM (.22), IL (.184), & MEE (.097)

Notes: Estimate is generated using synthetic control methods. The matching was based on urbanicity and three days of pre-SIPO expiration social distancing measures.

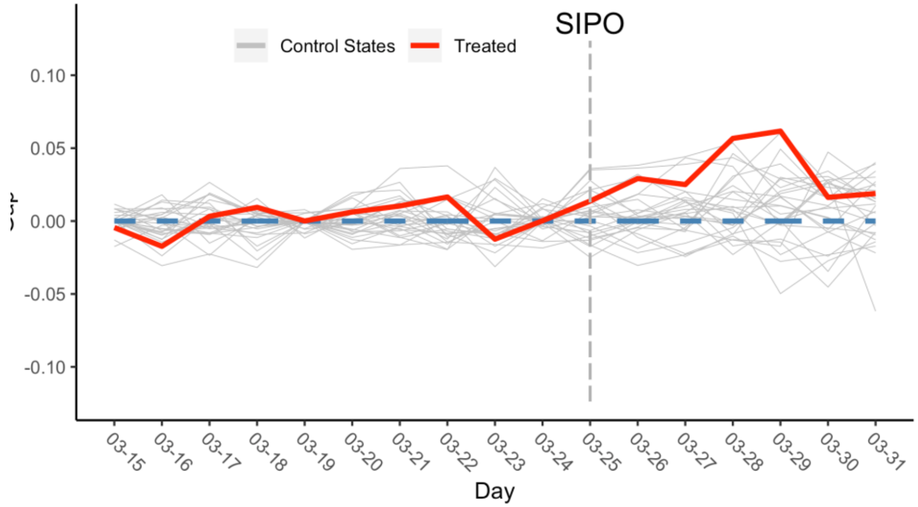
Appendix Figure 4. Synthetic Control Estimates for Initial enactment of the SIPO in WI

Panel (a): Synthetic WI v. Actual WI % Staying Home



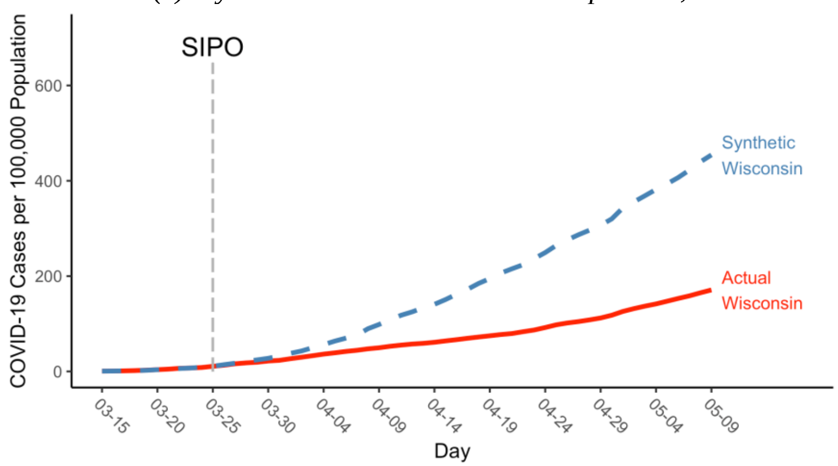
Note: Synthetic WI is comprised of NV (.316), IA (.30), TX (.134), MO (.114), UT (.07), & PA (.066)

Panel (b): Placebo Tests for % Staying at Home

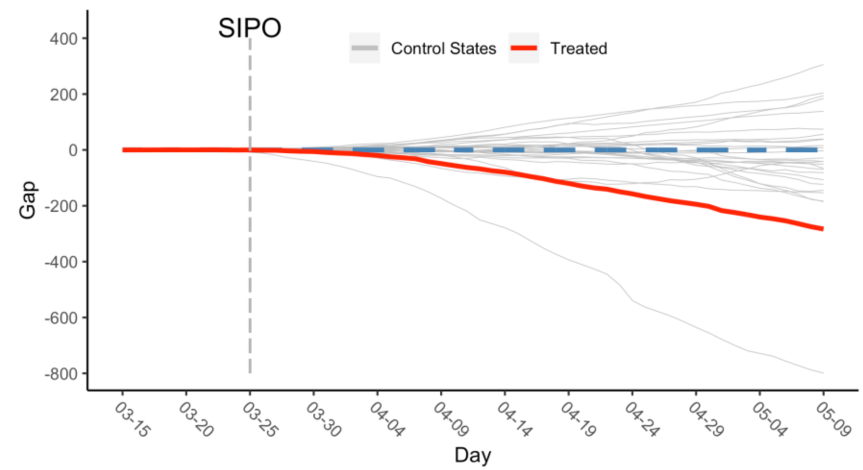


Note: Synthetic WI is comprised of NV (.316), IA (.30), TX (.134), MO (.114), UT (.07), & PA (.066)

Panel (c): Synthetic WI v. Actual WI Cases per 100,000



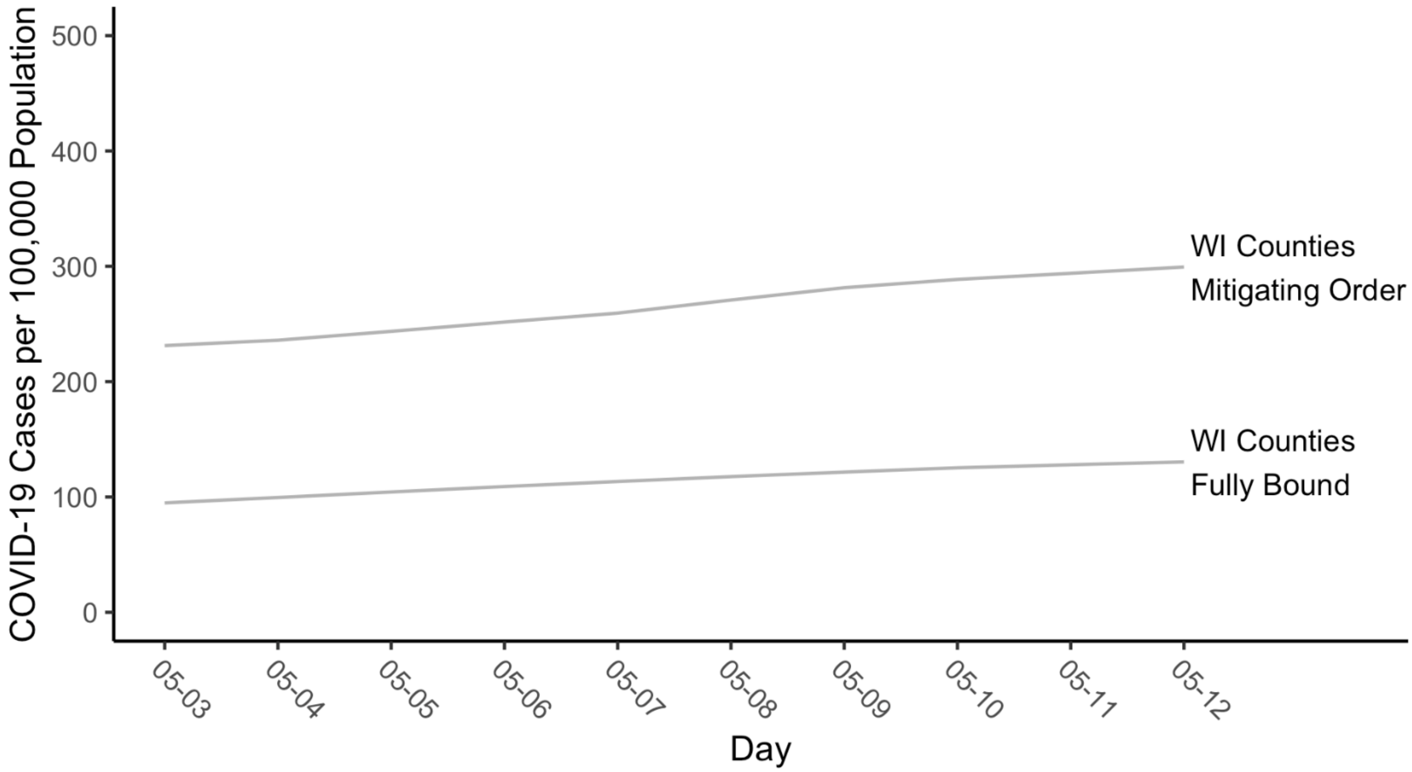
Note: Synthetic WI is comprised of NC (.824), VA (.069), NM (.04) & CA (.015).



Note: Synthetic WI is comprised of NC (.824), VA (.069), NM (.04) & CA (.015).

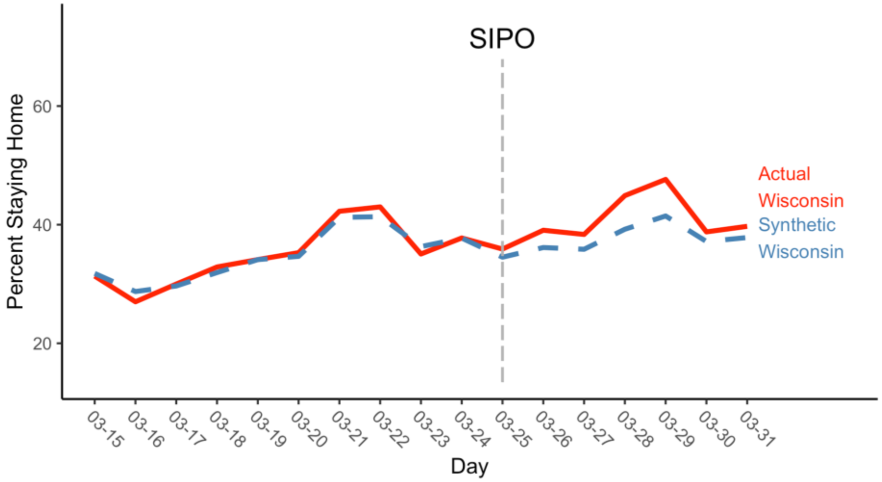
Notes: Estimate is generated using synthetic control methods. The matching was based on ten days of pre-SIPO expiration outcome measures.

Appendix Figure 5. Pre- WI Supreme Court Ruling Trends in COVID-19 Cases by WI County Type



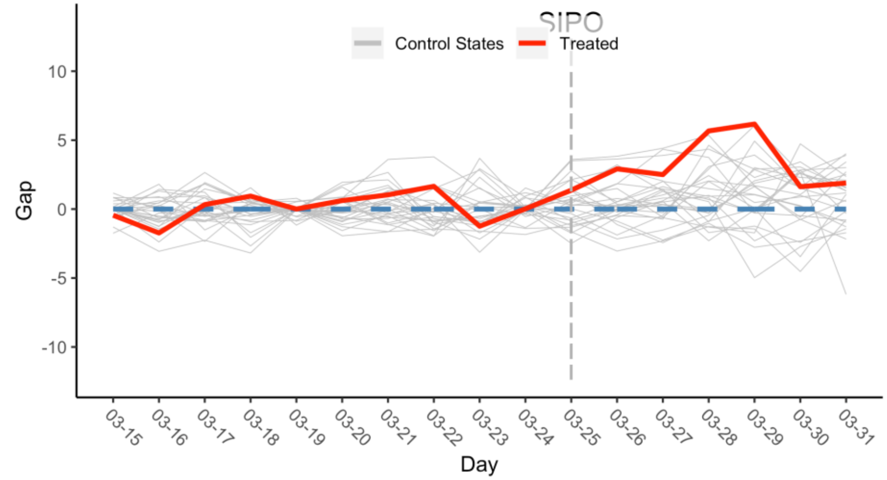
Appendix Figure 6. Synthetic Control Estimates for Initial Enactment of the SIPO in WI Among "Bound Wisconsin"

Panel (a): Synthetic WI v. Actual WI % Staying Home



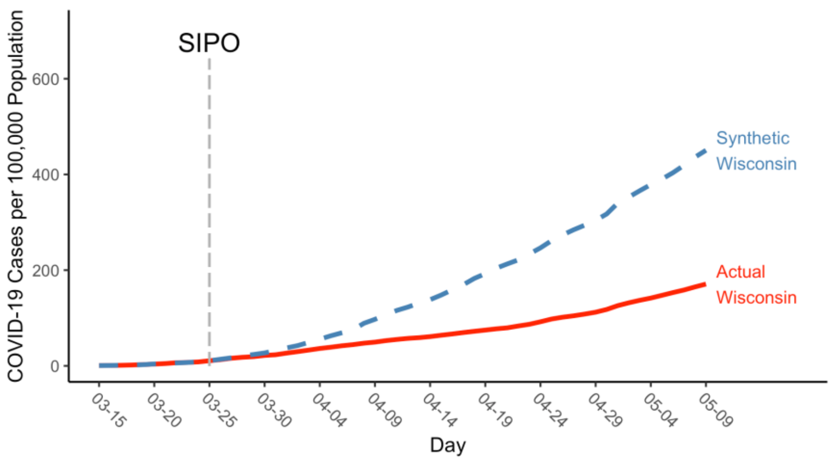
Note: Synthetic WI is comprised of MD (.401), ND (.262), MS (.183), & DC (.152)

Panel (b): Placebo Tests for % Staying at Home



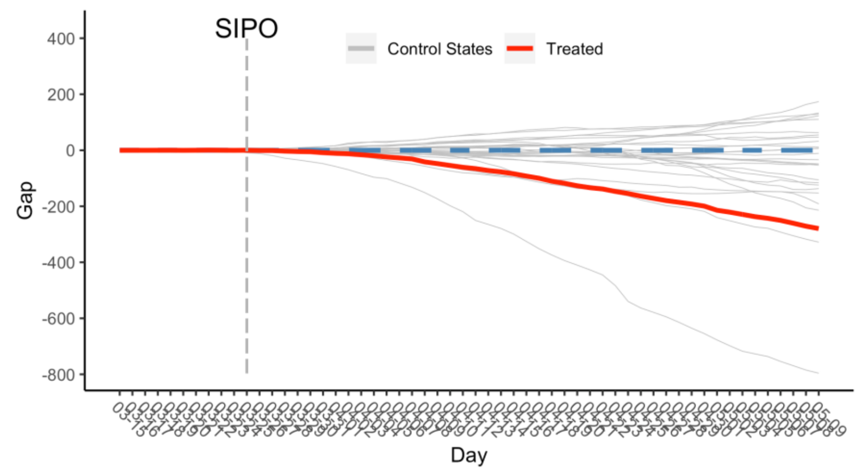
Note: Synthetic WI is comprised of MD (.401), ND (.262), MS (.183), & DC (.152)

Panel (c): Synthetic WI v. Actual WI Cases per 100,000



Note: Synthetic WI is comprised of NV (.427), MO (.251), ND (.162), & TN (.114)

Panel (d): Placebo Tests for Cases per 100,000



Note: Synthetic WI is comprised of NV (.427), MO (.251), ND (.162), & TN (.114)

Notes: Estimate is generated using synthetic control methods. The matching was based on ten days of pre-SIPO expiration outcome measures.

Appendix Table 1. Covariate Match for Synthetic Controls for Social Distancing

	Wisconsin	Rest of the U.S.	Donor States	Synthetic Wisconsin
	Panel I: % at Home Full Time			
Urbanicity	70.150	74.179	79.365	70.148
Population Density	107.345	430.364	888.276	155.810
Testing	2233.741	3242.280	3374.661	2251.400
Pre-Treat COVID-19 Cases	161.943	345.869	468.065	162.827
Reopening Policies	1.000	0.714	0.589	0.759
	Panel II: Median Hours at Home			
Urbanicity	70.150	74.179	79.365	70.135
Population Density	107.345	430.364	888.276	143.063
Testing	2233.741	3242.280	3374.661	2901.498
Pre-Treat COVID-19 Cases	161.943	345.869	468.065	162.442
Reopening Policies	1.000	0.714	0.589	0.881
	Panel III: Percent of Time at Home			
Urbanicity	70.150	74.179	79.365	70.150
Population Density	107.345	430.364	888.276	292.324
Testing	2233.741	3242.280	3374.661	2295.346
Pre-Treat COVID-19 Cases	161.943	345.869	468.065	164.371
Reopening Policies	1.000	0.714	0.589	0.661
	Panel IV: Part-Time Work			
Urbanicity	70.150	74.179	79.365	70.150
Population Density	107.345	430.364	888.276	328.337
Testing	2233.741	3242.280	3374.661	2557.004
Pre-Treat COVID-19 Cases	161.943	345.869	468.065	162.974
Reopening Policies	1.000	0.714	0.589	0.796
	Panel V: % Full-Time Work			
Urbanicity	70.150	74.179	79.365	67.616
Population Density	107.345	430.364	888.276	134.182
Testing	2233.741	3242.280	3374.661	2236.493
Pre-Treat COVID-19 Cases	161.943	345.869	468.065	162.757
Reopening Policies	1.000	0.714	0.589	0.626

Appendix Table 2A. List of Donor States that Received Positive Weights in Table 1 Panel I.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	MI (.262), LA (.223), ME (.131), NH (.128), HI (.046), NM (.033), OH (.033), IL (.028), PA (.021), VA (.02), DE (.018), OR (.015)	ME (.326), NH (.172), LA (.151), MI (.069), HI (.057), NM (.037), OH (.036), IL (.032), PA (.022), VA (.021), DE (.019), OR (.016)	MI (.296), NM (.208), LA (.185), NH (.149), ME (.09)	ME (.327), NH (.174), LA (.15), MI (.068), HI (.057), NM (.036), OH (.036), IL (.031), PA (.022), VA (.021), DE (.018), OR (.016)	ME (.369), OH (.213), NM (.201), HI (.154)	IL (.448), LA (.309), MI (.066), ME (.041), HI (.024), NM (.023), PA (.017), OH (.016)	NM (.764), IL (.19), ME (.046)	IL (.527), LA (.249), NM (.194), MI (.029)
Donor Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool	Full Pool
Observables for constructing weights:								
Days Pre-Treat Social Distance	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Reopening Policies	No	No	No	No	No	Yes	No	No

Appendix Table 2B. List of Donor States that Received Positive Weights in Table 1 Panel II.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	MI (.484), NM (.245), ME (.154), OH (.049)	MI (.377), NM (.363), OH (.045), NH (.034), ME (.03), LA (.029), DE (.02), PA (.02), VA (.02), IL (.018), OR (.016)	MI (.485), NM (.248), ME (.15), OH (.032), LA (.022)	MI (.488), ME (.332), NM (.043), DC (.04), LA (.016)	NM (.388), HI (.189), ME (.186), OR (.113), VA (.023), CA (.021), NH (.016), OH (.016)	MI (.537), ME (.28), NM (.132), LA (.018)	IL (.471), NM (.468), ME (.061)	NM (.464), IL (.411), OH (.122)
Donor Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool	Full Pool
Observables for constructing weights:								
Days Pre-Treat Social Distance	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Reopening Policies	No	No	No	No	No	Yes	No	No

Appendix Table 2C. List of Donor States that Received Positive Weights in Table 1 Panel III.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ME (.195), LA (.169), OH (.149), NM (.071), NH (.067), VA (.052), MI (.045), PA (.038), DE (.035), IL (.032), OR (.032), WA (.03), HI (.027), NY (.017), CA (.016), DC (.015)	ME (.199), LA (.175), OH (.135), NM (.079), NH (.052), VA (.048), MI (.044), IL (.037), PA (.035), HI (.034), OR (.034), WA (.033), DE (.031), CA (.023), NY (.02)	NM (534), ME (.215), OH (.035), VA (.026), MI (.022), IL (.02), PA (.02), DE (.019), HI (.017)	OH (.206), LA (.198), ME (.121), NM (.064), NH (.053), VA (.046), MI (.043), IL (.035), PA (.034), HI (.032), DE (.031), OR (.03), WA (.029), DC (.025), CA (.021), NY (.018)	NM (.385), ME (.351), HI (.146), VA (.047)	NM (.32), ME (.318), IL (.123), PA (.059), LA (.058), MI (.04), NJ (.025)	NM (.441), IL (.314), ME (.242)	NM (.34), IL (.283), ME (.19), OH (.126), NC (.06)
Donor Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool	Full Pool
Observables for constructing weights:								
Days Pre-Treat Social Distance	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Reopening Policies	No	No	No	No	No	Yes	No	No

Appendix Table 2D. List of Donor States that Received Positive Weights in Table 1 Panels IV and V.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel I: % Part-Time Work							
	ME (.28), NM (.214), CA (.107), PA (.043), NH (.042), NY (.039), OR (.038), WA (.037), MI (.036), DC (.034), VA (.027), NJ (.024), OH (.024), IL (.023), DE (.021)	WA (.334), ME (.271), NM (.137), CA (.042), NH (.025), OR (.024), IL (.023), MI (.021), NY (.018), DC (.017), NJ (.017), PA (.017), VA (.017)	WA (.337), ME (.271), NM (.13), OR (.034), NH (.031), CA (.03), PA (.028), MI (.027), NY (.025), VA (.018), IL (.017)	ME (.507), NM (.132), WA (.126), NH (.021), OR (.021), DC (.02), IL (.02), MI (.019), NY (.018), NJ (.017), PA (.017), VA (.017)	ME (.314), CA (.213), OR (.195), VA (.178), NM (.038)	NM (.299), ME (.287), PA (.273), MI (.038), NJ (.035), IL (.032), HI (.018)	MI (.399), NM (.322), IL (.116), ME (.07), PA (.069), DE (.021)	MI (.442), NM (.22), VA (.159), OR (.057), HI (.042), CA (.038), ME (.033)
	Panel II: % Full-Time Work							
	NH (.485), NM (.22), IL (.184), ME (.097)	NH (.476), ME (.365), IL (.153)	NH (.479), NM (.226), IL (.19), ME (.093)	ME (.411), NH (.305), VA (.246)	NH (.461), OR (.286), ME (.179), HI (.024)	NH (.48), ME (.365), IL (.149)	NM (.409), DE (.242), CA (.173), IL (.128), ME (.031), WA (.017)	NH (.34), ME (.228), OH (.19), VA (.174), CA (.04), LA (.027)
Donor Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool	Full Pool
Observables for constructing weights:								
Days Pre-Treat Social Distance	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Reopening Policies	No	No	No	No	No	Yes	No	No

Appendix Table 3: Covariate Match for Synthetic Controls for COVID-19 Cases & Deaths

	Wisconsin	Rest of the U.S.	Donor States	Synthetic Wisconsin
	Panel I: COVID-19 Cases per 100,000			
Urbanicity	70.150	74.179	79.365	70.134
Population Density	107.345	430.364	888.276	229.045
Testing	2233.741	3242.280	3374.661	2216.473
Pre-Treat Social Distance	37.5	37.1	40.4	37.5
Reopening Policies	1.000	0.714	0.589	0.498
	Panel II: COVID-19 Deaths per 100,000			
Urbanicity	70.150	74.179	79.365	70.167
Population Density	107.345	430.364	888.276	110.253
Testing	2233.741	3242.280	3374.661	2230.186
Pre-Treat Social Distance	37.5	37.1	40.4	38.4
Reopening Policies	1.000	0.714	0.589	0.315

Appendix Table 4. List of Donor States that Received Positive Weights in Table 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel I: COVID-19 Cases per 100,000							
	NC (.681), VA (.127), OR (.092), NM (.041), CA (.015)	NC (.779), VA (.091), NM (.075)	NC (.687), OR (.308)	NC (.788), VA (.106), NM (.032), CA (.015)	NC (.681), VA (.127), OR (.092), NM (.041), CA (.015)	NC (.793), CA (.09), NM (.034), ME (.019)	NC (.793), CA (.09), NM (.034), ME (.019)	NC (.824), VA (.069), NM (.04), CA (.015).
	Panel II: COVID-19 Deaths per 100,000							
	HI (.344), ME (.326), NM (.128), NC (.029), OR (.029), CA (.02), VA (.019), OH (.017), WA (.015)	OR (.625), NM (.116), HI (.073), ME (.045), WA (.025), CA (.015)	HI (.436), OR (.404), NH (.119)	OR (.63), ME (.105), VA (.079), HI (.037), NC (.019), CA (.018), DE (.015)	HI (.63), NM (.125), ME (.033), OR (.031), WA (.025), CA (.022), VA (.018), NC (.017), DE (.015), OH (.0150	HI (.678), NM (.175), ME (.048), IL (.024), PA (.021), MI (.019), LA (.017)	HI (.678), NM (.175), ME (.048), IL (.024), PA (.021), MI (.019), LA (.017)	HI (.567), NM (.113), OR (.085), ME (.03), VA (.029), CA (.027), NC (.025), WA (.02), OH (.018), DE (.017)
Donor Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool	Full Pool
Observables for constructing weights:								
Days Pre-Treat Cases/Deaths	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Reopening Policies	No	No	No	No	No	Yes	No	No

Appendix Table 5. Sensitivity to the Inclusion of State-Specific Linear Time Trend

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	% Staying at Home	Median % Time Home	Median Hours at Home	% Part Time Workers	% Full Time Workers	Log(Cases)	Log(Deaths)
				Panel I: Overall			
WI Supreme Court SIPO Ruling	0.747	1.159	0.216	-0.079	0.274	-0.003	-0.007
Permutation-based [p-value]	[.666]	[.444]	[.570]	[.764]	[.400]	[.882]	[.842]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{12/18}	{8/18}	{4/7}	{13/17}	{2/5}	{15/17}	{16/19}
				Panel II: Mitigating Local Order			
WI Supreme Court SIPO Ruling * WI County Fully Bound	0.731	0.557	0.148	-0.065	0.258	0.007	-0.112
Permutation-based [p-value]	[.666]	[.111]	[.428]	[.764]	[.200]	[.587]	[.263]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{12/18}	{2/18}	{3/7}	{13/17}	{1/5}	{10/17}	{5/19}
WI Supreme Court SIPO Ruling * WI County Mitigating Order	0.763	1.771	0.286	-0.093	0.291	-0.012	0.063
Permutation-based [p-value]	[.705]	[.882]	[.713]	[.813]	[.400]	[.813]	[.112]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{12/17}	{15/17}	{5/7}	{13/16}	{2/5}	{13/16}	{2/18}
				Panel III: Current Local Order			
WI Supreme Court SIPO Ruling * WI County w/o Current Order	0.615	1.177	0.169	-0.025	0.256	0.042	0.202
Permutation-based [p-value]	[.666]	[.333]	[.570]	[.647]	[.400]	[.470]	[.158]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{12/18}	{6/18}	{4/7}	{11/17}	{2/5}	{8/17}	{3/19}
WI Supreme Court SIPO Ruling * WI County with Current Order	0.784	1.153	0.230	-0.094	0.279	-0.015	-0.085
Permutation-based [p-value]	[.824]	[.412]	[.428]	[.813]	[.400]	[.250]	[.112]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{14/17}	{7/17}	{3/7}	{13/16}	{2/5}	{4/16}	{2/18}

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	% Staying at Home	Median % Time Home	Median Hours at Home	% Part Time Workers	% Full Time Workers	Log(Cases)	Log(Deaths)
				Panel IV: County Urbanicity			
WI Supreme Court SIPO Ruling * ≥ 50% Urbanicity	0.651	1.332	0.183	-0.082	0.276	-0.016	0.005
Permutation-based [p-value]	[.722]	[.166]	[.428]	[.824]	[.400]	[.470]	[.947]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{13/18}	{3/18}	{3/7}	{14/17}	{2/5}	{8/17}	{18/19}
WI Supreme Court SIPO Ruling* < 50% Urbanicity	1.098	0.523	0.338	-0.066	0.269	0.048	-0.114
Permutation-based [p-value]	[.713]	[.929]	[.286]	[.922]	[.600]	[.356]	[.500]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{10/14}	{13/14}	{2/7}	{12/13}	{3/5}	{5/14}	{7/14}
				Panel V: County Population Density			
WI Supreme Court SIPO Ruling * ≥ 75 people per sq. mi	0.612	1.351	0.178	-0.087	0.276	-0.005	0.008
Permutation-based [p-value]	[.722]	[.222]	[.713]	[.764]	[.400]	[.764]	[.788]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{13/18}	{4/18}	{5/7}	{13/17}	{2/5}	{13/17}	{15/19}
WI Supreme Court SIPO Ruling* <75 people per sq. mi	1.203	0.509	0.345	-0.051	0.270	0.007	-0.127
Permutation-based [p-value]	[.532]	[.800]	[.428]	[.929]	[.600]	[1.000]	[.266]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{8/15}	{12/15}	{3/7}	{13/14}	{3/5}	{14/14}	{4/15}
				Panel VI: County % Voted for Trump			
WI Supreme Court SIPO Ruling * ≥50% Voted for Trump	0.550	0.582	0.077	-0.034	0.271	0.017	0.039
Permutation-based [p-value]	[1.000]	[0.875]	[1.000]	[.866]	[.400]	[.437]	[.500]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{16/16}	{14/16}	{7/7}	{13/16}	{2/5}	{7/16}	{8/16}
WI Supreme Court SIPO Ruling* <50% Voted for Trump	0.954	1.763	0.362	-0.126	0.277	-0.022	-0.050
Permutation-based [p-value]	[.625]	[0.188]	[.428]	[.532]	[.400]	[.563]	[.186]
Placebo Test {Wisconsin Rank / # Donor States + 1}	{10/16}	{3/16}	{3/7}	{8/15}	{2/5}	{9/16}	{3/16}
Mean of Dependent Variable	38.972	93.002	12.235	5.244	3.289	5.198	2.603
N	17776	19624	8052	18216	5126	18885	15471

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

Notes: Regressions include Wisconsin and each donor state that included positive weights greater than 0.1. The weights are generated by multiplying share of state population by the synthetic weights. All estimates include: an indicator for whether retail store and restaurant or bar reopened, an indicator for whether personal or pet care services reopened, an indicator for whether entertainment and physical activity facilities reopened, log testing, state-specific linear time trends, county and day fixed effects. P-values, generated using permutation test, are reported inside brackets.

Appendix Table 6A. Wisconsin County-Level Estimates of the Association Between SIPO Expiration and Social Distancing, Cases

	(1) % Staying at Home	(2) Median % Time Home	(3) Median Hours at Home	(4) % Part Time Workers	(5) % Full Time Workers
	Panel I: Difference-in-Difference Estimate				
SIPO Expiration	-0.263*	-1.333***	-0.226***	0.100**	-0.042
	(0.133)	(0.347)	(0.080)	(0.038)	(0.025)
	Panel II: Lagged Effect				
0-3 Days After	0.010	-0.696**	-0.081	0.060	-0.055
	(0.143)	(0.330)	(0.077)	(0.054)	(0.039)
4+ Days After	-0.509**	-1.909***	-0.358***	0.136***	-0.030
	(0.200)	(0.344)	(0.091)	(0.042)	(0.026)
N	1584	1584	1584	1584	1584

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

Notes: Regressions include only Wisconsin. All estimates include: county and day fixed effects. Standard errors, clustered at the county-level, is reported inside parenthesis.

Appendix Table 6B. Wisconsin County-Level Estimates of the Association Between SIPO Expiration and Social Distancing, Cases

	(1)	(2)
	Log(Cases)	Log(Deaths)
	Panel I: Difference-in-Difference Estimate	
SIPO Expiration	0.025	0.044
	(0.055)	(0.068)
	Panel II: Lagged Effect	
0-4 Days After	0.022	0.055
	(0.040)	(0.057)
5-9 Days After	0.027	0.052
	(0.066)	(0.086)
10+ Days After	0.032	-0.006
	(0.087)	(0.079)
N	1667	875

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

Notes: Regressions include only Wisconsin. All estimates include: county and day fixed effects. Standard errors, clustered at the county-level, is reported inside parenthesis.

Appendix Table 7. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on Social Distancing for "Bound Wisconsin"

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel I: % Percent at Home Full-Time				
SIPO	0.190	0.257	0.267	-0.156	0.405	-0.011	-1.550	-0.826
P-Value	[.556]	[.389]	[.500]	[.333]	[.611]	[.111]	[.917]	[.889]
				Panel II: Median Hours at Home				
SIPO	-0.184	-0.334	-0.191	-0.079	-0.124	-0.379	-0.631	-0.610
P-Value	[.444]	[.333]	[.444]	[.722]	[.667]	[.222]	[.333]	[.389]
				Panel III: Percent of Time at Home				
SIPO	-0.671	-0.647	-0.710	-0.642	-0.687	-0.544	-1.425	-1.138
P-Value	[.556]	[.556]	[.500]	[.667]	[.611]	[.556]	[.583]	[.667]
				Panel IV: Part-Time Work				
SIPO	-0.265	-0.137	-0.142	-0.149	-0.225	-0.011	0.025	0.008
P-Value	[.278]	[.278]	[.111]	[.222]	[.222]	[.111]	[.417]	[.111]
				Panel V: % Full-Time Work				
SIPO	0.120	0.120	0.119	0.121	0.120	0.001	0.003	-0.005
P-Value	[.222]	[.222]	[.278]	[.222]	[.222]	[.333]	[.833]	[.778]
Donor Pool	Full Pool[a]	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool[b]	Full Pool
Observables for constructing weights:								
Days Pre-Treat Social Distance	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Testing Rates	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Reopening Policies	No	No	No	No	No	Yes	No	No

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

Notes: Estimate is generated using synthetic control methods. The matching was based off pre-treatment social distancing and observables listed under each column. The permutation-based p-values are included in brackets below each point estimate.

[a]Donor states included CA, DC, DE, HI, IL, LA, ME, MI, NH, NC, NJ, NM, NY, OH, OR, PA, VA, and WA.

[b]For this specification, the donor pool is restricted to those states that had a SIPO over the entire sample period under study and had no reopening of restaurants or bars.

Appendix Table 8. Synthetic Control Estimates of Effect of Wisconsin Supreme Court Abolition of SIPO on COVID-19 Cases & Deaths for "Bound Wisconsin"

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel I: COVID-19 Cases per 100,000							
SIPO	-6.192	-6.099	-5.878	3.212	-8.564	-5.757	1.468	-7.371
P-Value	[.706]	[.647]	[.706]	[.941]	[.529]	[.706]	[1.000]	[.706]
	Panel II: COVID-19 Deaths per 100,000							
SIPO	0.003	0.010	0.070	0.080	0.001	0.014	-1.301	-0.031
P-Value	[.833]	[.833]	[.667]	[.667]	[.833]	[1.000]	[1.000]	[.889]
Donor Pool	Full Pool[a]	Full Pool	Full Pool	Full Pool	Full Pool	Full Pool	Limited Pool[b]	Full Pool
Observables for constructing weights:								
Days Pre-Treat Cases/Deaths	3	3	3	3	3	3	10	10
Urbanicity	Yes	No	Yes	No	No	No	No	No
Population Density	No	Yes	Yes	No	No	No	No	No
Social Distancing	No	No	No	Yes	No	No	No	No
Pre-Treat COVID-19 Cases	No	No	No	No	Yes	No	No	No
Reopening Policies	No	No	No	No	No	Yes	No	No

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level

Notes: Estimate is generated using synthetic control methods. The matching was based off pre-treatment cases or deaths and observables listed under each column. The permutation-based p-values are included in brackets below each point estimate.
[a]Donor states included CA, DC, DE, HI, IL, LA, ME, MI, NH, NC, NJ, NM, NY, OH, OR, PA, VA, and WA.
[b]For this specification, the donor pool is restricted to those states that had a SIPO over the entire sample period under study and had no reopening of restaurants or bars.

Appendix Table 9A. Wisconsin County-Level Estimates of the Association Between SIPO Expiration and Social Distancing

	(1) % Staying at Home	(2) Median % Time Home	(3) Median Hours at Home	(4) % Part Time Workers	(5) % Full Time Workers
	Panel I: Heterogeneous Treatment Effect by Urbanicity				
0-3 Days After* ≥ 80% Urbanicity	-0.002	0.035	-0.143**	-0.001	-0.001*
	(0.002)	(0.193)	(0.062)	(0.001)	(0.000)
4+ Days After * ≥ 80% Urbanicity	-0.003	-1.016***	-0.246***	0.001	-0.001
	(0.005)	(0.319)	(0.064)	(0.001)	(0.001)
0-3 Days After* <80% Urbanicity	0.000	-1.044***	-0.095**	0.001*	-0.001
	(0.002)	(0.260)	(0.041)	(0.001)	(0.000)
4+ Days After * <80% Urbanicity	0.001	0.476	-0.118*	-0.001	-0.001**
	(0.003)	(0.410)	(0.064)	(0.001)	(0.000)
	Panel II: Heterogeneous Treatment Effect by Population Density				
0-3 Days After* ≥ 250 people per sq. mi	-0.001	-0.005	-0.171***	0.000	-0.001**
	(0.002)	(0.183)	(0.051)	(0.001)	(0.000)
4+ Days After * ≥ 250 people per sq. mi	0.002	-0.626	-0.217***	-0.001	-0.001
	(0.004)	(0.391)	(0.053)	(0.001)	(0.001)
0-3 Days After*< 250 people per sq. mi	0.000	-1.242***	-0.063	0.001	-0.001
	(0.002)	(0.266)	(0.041)	(0.001)	(0.000)
4+ Days After * < 250 people per sq. mi	-0.001	0.517	-0.123*	-0.001	-0.001**
	(0.003)	(0.422)	(0.070)	(0.001)	(0.000)
	Panel III: Heterogeneous Treatment Effect by Share of 2016 Trump Votes				
0-3 Days After* ≥ 50% Vote for Trump	-0.001	-0.738***	-0.156***	0.001	-0.000
	(0.002)	(0.272)	(0.035)	(0.001)	(0.000)
4+ Days After * ≥ 50% Vote for Trump	0.002	0.291	-0.133**	-0.001	-0.001**
	(0.003)	(0.450)	(0.059)	(0.001)	(0.000)
0-3 Days After* < 50% Vote for Trump	0.001	-0.550	0.042	-0.000	-0.001
	(0.003)	(0.331)	(0.056)	(0.001)	(0.001)
4+ Days After * < 50% Vote for Trump	-0.006	-0.574	-0.163	-0.001	-0.002*
	(0.004)	(0.569)	(0.114)	(0.001)	(0.001)
N	1152	1152	1152	1152	1152

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level
Notes: Regressions include only Wisconsin. All estimates include: county and day fixed effects. Standard errors, clustered at the county-level, is reported inside parenthesis.

Appendix Table 9B. Wisconsin County-Level Estimates of the Association Between SIPO Expiration and Cases, Deaths

	(1)	(2)
	Log(Cases)	Log(Deaths)
	Panel I: Heterogeneous Treatment Effect by Urbanicity	
0-4 Days After* ≥ 80% Urbanicity	-0.030	0.074
	(0.039)	(0.104)
5-9 Days After* ≥ 80% Urbanicity	-0.057	0.112
	(0.072)	(0.171)
10+ Days After * ≥ 80% Urbanicity	-0.098	0.049
	(0.086)	(0.159)
0-4 Days After* < 80% Urbanicity	0.048	0.041
	(0.042)	(0.075)
5-9 Days After* < 80% Urbanicity	0.066	0.014
	(0.068)	(0.097)
10+ Days After* < 80% Urbanicity	0.078	-0.034
	(0.092)	(0.094)
	Panel II: Heterogeneous Treatment Effect by Population Density	
0-4 Days After* ≥ 250 people per sq. mi	-0.021	0.122
	(0.040)	(0.101)
5-9 Days After* ≥ 250 people per sq. mi	-0.031	0.163
	(0.070)	(0.152)
10+ Days After* ≥ 250 people per sq. mi	-0.063	0.097
	(0.086)	(0.151)
0-4 Days After* < 250 people per sq. mi	0.055	-0.024
	(0.045)	(0.039)
5-9 Days After* < 250 people per sq. mi	0.070	-0.077*
	(0.072)	(0.044)
10+ Days After* < 250 people per sq. mi	0.085	-0.105
	(0.096)	(0.070)
	Panel III: Heterogeneous Treatment Effect by Share of 2016 Trump Votes	
0-4 Days After* ≥ 50% Vote for Trump	0.023	0.094
	(0.045)	(0.080)
5-9 Days After* ≥ 50% Vote for Trump	0.035	0.086
	(0.071)	(0.107)
10+ Days After* ≥ 50% Vote for Trump	0.049	0.013
	(0.091)	(0.093)
0-4 Days After* < 50% Vote for Trump	0.020	-0.024
	(0.047)	(0.037)
5-9 Days After* < 50% Vote for Trump	0.007	-0.063
	(0.081)	(0.085)
10+ Days After* < 50% Vote for Trump	-0.035	-0.124
	(0.111)	(0.115)
N	1667	875

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level
Notes: Regressions include only Wisconsin. All estimates include: county and day fixed effects. Standard errors, clustered at the county-level, is reported inside parenthesis.