

IIRESS Labs Coronavirus Disease 2019 (COVID-19), Technical Report 2: Assessing Social Distancing Effectiveness as a Public Health Intervention in the US – 5/18/2020

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Introduction/Background

Social distancing (also called physical distancing), is a theoretical non-pharmaceutical intervention (NPI) designed to reduce the impact of an epidemic on the healthcare system of an affected area. In the United States (US), social distancing has been implemented to various degrees across the nation, the strength of implementation determined by state or county public health officials. For the most part, following outbreaks of COVID-19 in Washington, New York, and California, gathering restrictions across the nation went into place the week of March 12th, followed by the closure of educational facilities the week of March 18th, followed then by shelter-in-place or stay-at-home orders the week of March 23rd. The strength of these interventions (NPIs) can be measured by a relative “social distancing” (or physical distancing) metric, such as a measurement of local human activity (e.g., footsteps, shopping rate, GPS activity) which are readily available through routine data collections systems (e.g., cellular phone marketing data). These interventions peaked around the week of April 13th, and have since steadily declined as more and more states and counties ease social distancing restrictions (Figure 1).

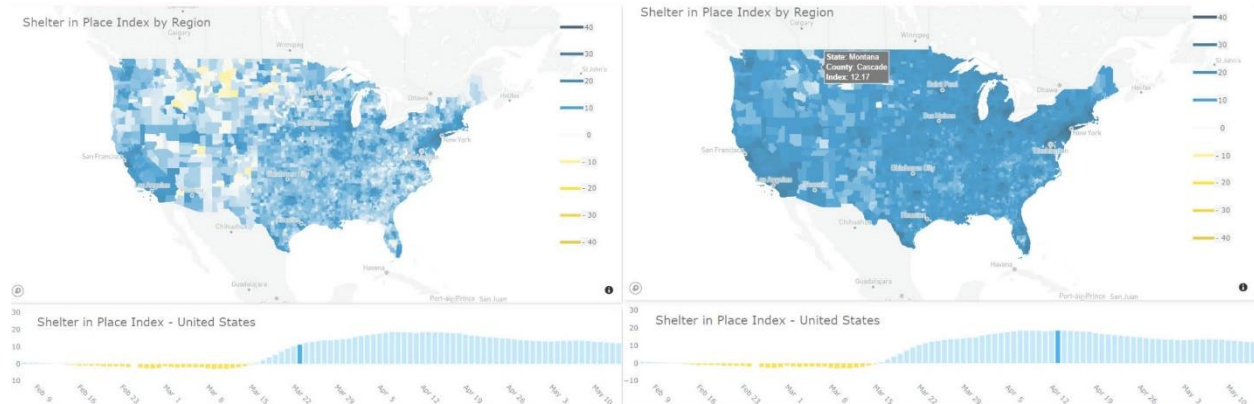


Figure 1. SafeGraph Shelter in Place Index (SPI), an indicator of social distancing strength by region (US state or county level).

One such data set is the SafeGraph (<https://docs.safegraph.com/docs/social-distancing-metrics>), who publishes a data set utilizing smartphone data obtained by Veraset (<https://www.veraset.com/>), the output of which is pictured here in Figure 1. One thing to note here is that regardless of official state or county-level public health restrictions (some states did not ever issue a stay-at-home order), the entire nation engaged in stay-at-home behavior, thereby reducing their out-of-home exposure to other people. Part of the successful implementation of this intervention nation-wide can likely be attributed to the “Stay Home, Save Lives” social movement, which encouraged (AdCouncil, 2020; Godoy, 2020).

As the epidemiological curve of COVID-19 infections in the US began to “flatten” (Figure 2), the questions of A.) How long social distancing practices would need to be maintained, and B.) How effective were the interventions began to arise?

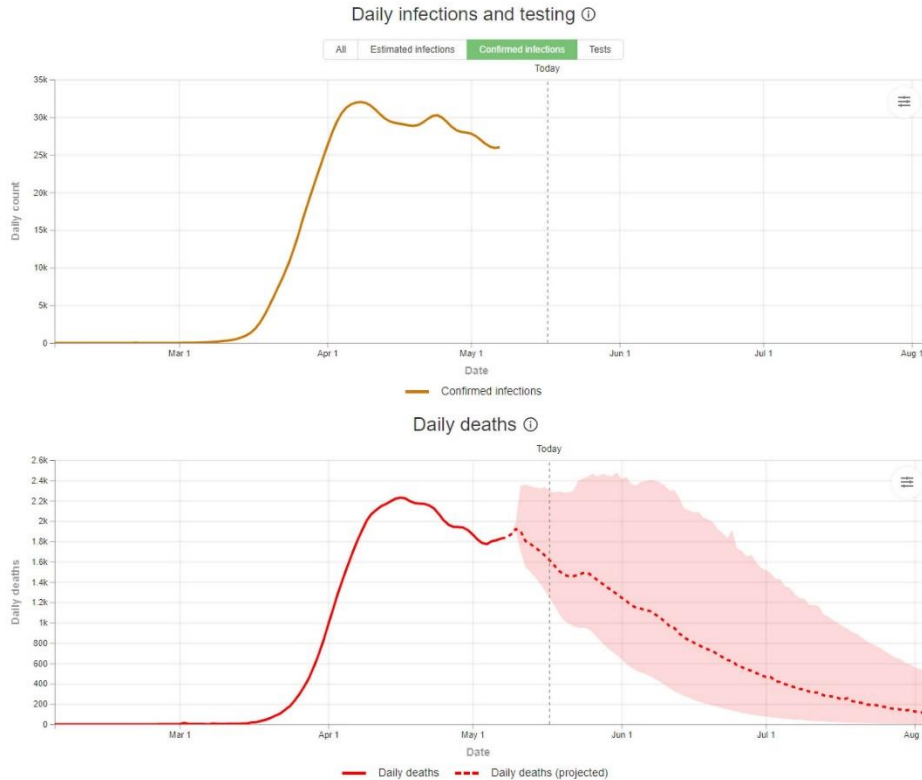


Figure 2. Epidemiological curve of COVID-19 in the United States, March 1st 2020 through May 17th 2020, with projected deaths through August 1st. Daily infection count lags behind current infection count (data shown through May 7th) due to a smoothing measure implemented by IMHE (<https://covid19.healthdata.org/united-states-of-america>).

Due to the economic impact of prolonged maintenance of stay-at-home orders, which includes the closure of non-essential businesses, several US states began easing restrictions as early as May 1st, with many states following with phased-reopenings. The question of what restrictions can be lifted and what restrictions can be maintained is currently relatively unknown to the scientific community as large-scale NPIs of this nature have yet to be implemented in response to a global pandemic in modern times.

Results/Methods

To assess the success of interventions and better understand which types of phased-reopenings better maintain the benefits of stay-at-home orders while allowing the benefit of continued business, I first evaluated the change in infection rate on a per-state basis using a 5-day average of the percent change in number of infections from day to day. Using this method, I found that states with low population density (Vermont, Montana, Alaska, Hawaii) currently already have very low rates of infection, meaning that these states are seeing a very small amount of new cases relative to their current case count, and

classified this group as a “Low New Infection Rate” group (Table 1). In the case of New York, a low new-infection count is likely due to that state already being at the very tail end of its epidemiological curve, meaning its epidemic phase has likely ended.

Secondly, I identified a middle new infection rate group (Table 1), which again consisted of low-population density states that implemented some type of stay-at-home intervention, and are currently seeing steady, low rates of new infections. Like New York, Washington state is found in this group most likely due to it also already being on the tail end of its epidemiological curve.

Third, I identified a “High New Infection Rate” group, which is consisted of states very early in their epidemiological curve (e.g., Arizona, Minnesota, North Carolina), or states that never implemented any type of stay-at-home order (e.g., Nebraska, South Dakota, North Dakota), or states that have already ended their stay-at-home orders in the earliest time point of May 1st (Kansas, North Carolina). It’s important to remember here that while the total number of infections per day is lower in Nebraska (457 May 10th) compared to New York (3,020 May 9th), on a percentage basis South Dakota is seeing an increase in new infections whereas New York is seeing a decrease.

I considered these observations to be one point of evidence suggesting that NPIs (stay-at-home and social distancing restrictions) have demonstrated success at inhibiting new infections at various stages in epidemiological curves. This data would also suggest that at the time, Minnesota is at extreme risk for experiencing a resurgence of COVID-19 infections.

5 Day average percent change in confirmed COVID-19 infections			
Top 5 States - Lowest New Infection Rate			
	5-10-AVG		5-17-AVG
Montana	0.09	Vermont	0.17
Hawaii	0.26	Hawaii	0.19
Vermont	0.42	Montana	0.39
Alaska	0.48	Alaska	0.62
New York	0.86	New York	0.63
Middle 5 States - Medium New Infection Rate			
	5-10-AVG		5-17-AVG
Washington	2.24	Wyoming	2.07
Rhode Island	2.63	Nevada	2.08
Oregon	2.75	Ohio	2.08
Utah	2.76	Utah	2.12
Colorado	2.78	Indiana	2.12
Top 5 States - Highest New Infection Rate			
	5-10-AVG		5-17-AVG
Arizona	4.21	Nebraska	3.58
South Dakota	4.97	North Carolina	3.63
Kansas	5.17	Arizona	3.68
Nebraska	6.11	North Dakota	4.02
Minnesota	8.33	Minnesota	4.89

Table 1. Top 5 Lowest, middle, and highest states by new infection rate for two time points (5/10/2020 and 5/17/2020). Rates were determined by taking a 5 day average of the percent change in infection rate relative to the previous day.

Following this observation, I considered the possibility that “Pact-Status”, that is, the formation of multiple statewide alliances in geographically close areas might have additionally granted some additional benefit through regional similarities in social distancing practicing. In this graph, I combined the 5-day average of new infection rates as seen in Table 1, but by grouping each state within its pact. The 3 “Pact” groups that I identified were the Western States Pact (California, Oregon, Washington, Colorado, and Nevada), the Midwest States Pact (Illinois, Indiana, Kentucky, Michigan, Minnesota, Ohio, and Wisconsin), and the Eastern States Pact (Connecticut, Delaware, Massachusetts, New Jersey, New York, Pennsylvania, and Rhode Island). The remaining 4 groups were marked by their status as either having no pact but early partial opening (e.g., Georgia), no pact but staying-at-home (e.g., Vermont), no pact stay-at-home expiring with no reopening plan (e.g., Arizona), and no pact with no stay-at-home order ever issued (e.g., Nebraska). A full list of the states and their pact-status, social distancing index status, and 5-day % infection difference count can be seeing in Supplementary Table 1 at the end of the document.

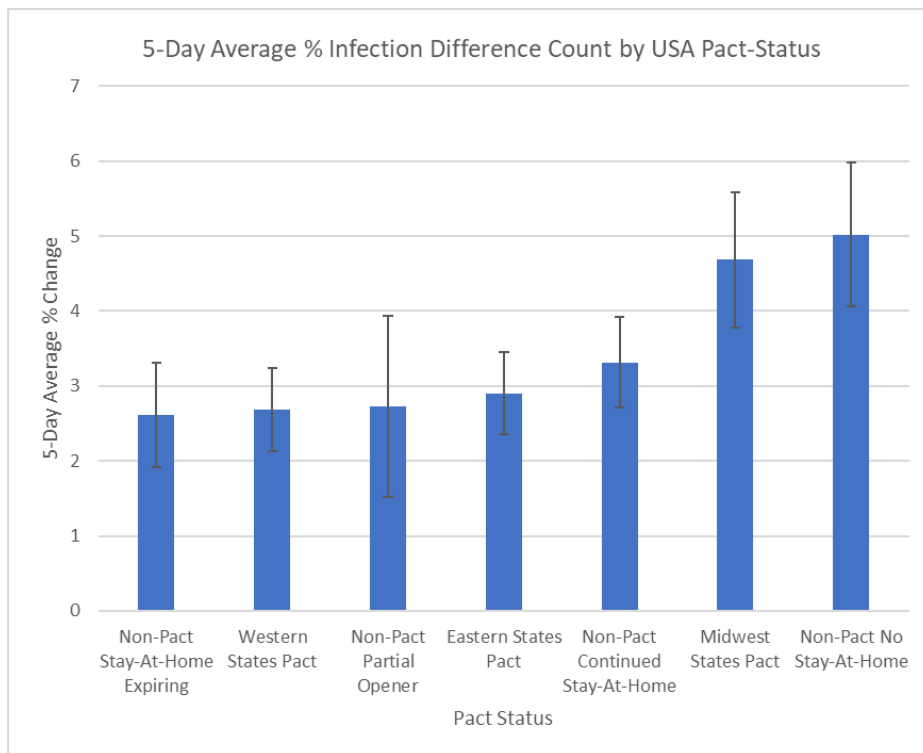


Figure 3. Mean 5-day average percent change in infection rate by state “Pact Status”. See Supplementary Table 1 for a full list of states and their pact status in this study.

To better understand the suggestion of a correlation between stay-at-home orders and social distancing restrictions, I sought to assess the strength and direction of the correlation by comparing a social distancing metric (the Shelter in Place Index, SPI) from SafeGraph with the 5-day average % change in infection rate (5-DAY-AVG) across the US. To understand this correlation, I collected SPI data for two time points (May 5th 2020 and May 12th 2020), which would correspond to 5 days prior (the median incubation time for SARS-CoV-2 to present as a clinical COVID-19 infection) to the last time point in the 5-DAY-AVG. Using a linear regression model, I found that SPI is weakly negatively correlated with 5-DAY-AVG at both the May 10th and May 17th time points ($R^2 = 0.004$, and 0.035 , respectively), suggesting that increased SPI may result in reduced new infection rates, but that the direct strength of this relationship is either unknown or not very strong (Figure 4).

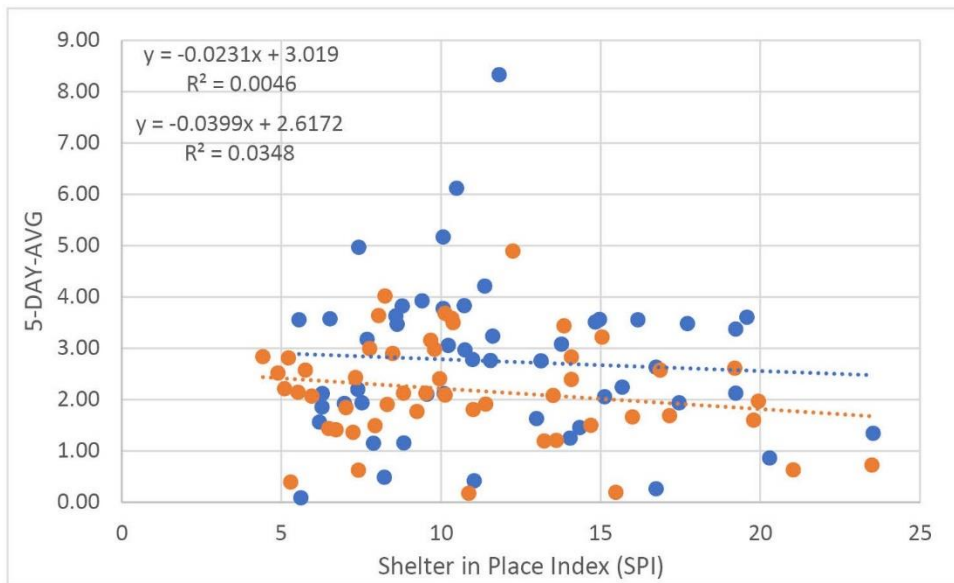


Figure 4. Linear regression analysis of the SPI and 5-DAY-AVG for two time points (5/10/2020 and 5/17/2020). Blue dots represent data from 5/10 and orange dots represent data from 5/17.

Combining the 2 time data points (May 10th and May 17th) by calculating the change in SPI and change in 5-DAY-AVG between the two points might give a hint as to the relationship between changes in SPI and corresponding impact on infection rate, I sought to identify a relationship between increases in SPI (increased social distancing) and decreased infection rates. Using a linear regression model, there appears to be a weak correlation between change in SPI and change in new infection rate, meaning that a lag time is likely present in the data (Figure 5). Here, we can see that Minnesota increased an increase in social distancing measures that likely resulted in a corresponding decrease in infection rates. On the other hand, we can see that Florida experienced a decrease in social distancing measures followed by an increase in new infection rates. Although the strength of the correlation is relatively weak ($R^2 = 0.10$), the clear segmentation of states into quadrants based on their social distancing policies suggests the correlation between change in SPI and change in 5-DAY-AVG is in some part a causative relationship, meaning that changes in social distancing measures are seen in changes in infection rates.

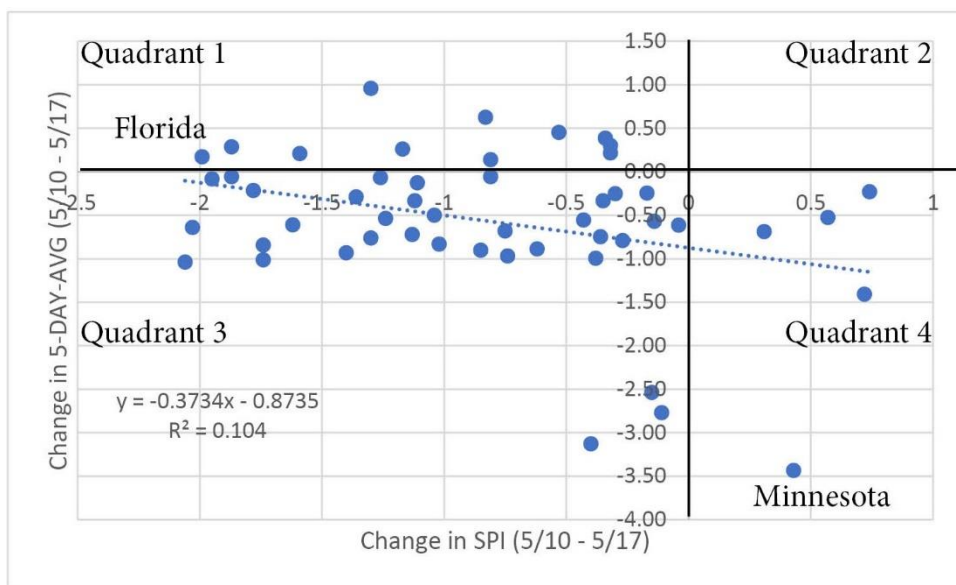


Figure 5. Linear regression analysis of the change in SPI to the change in 5-DAY-AVG for two time points (5/10/2020 and 5/17/2020).

Reviewing this relationship and dividing the spread of the data we can segregate the states into 4 quadrants based on their current status in the continuum of social distancing interventions and infection rate “space”. Continued development of this model might assist public health officials in designing successful interventions for epidemic or pandemic scenarios, continuing through the COVID-19 pandemic and beyond. Interpretations of the quadrants are as follows:

Quadrant 1: Decreasing social distancing, increasing infection rate. States exhibiting sustained patterns in this quadrant would suggest the need for a reintroduction of stricter social distancing measures and may be at risk of a resurgence of COVID-19 infections. This quadrant would be considered the most at-risk quadrant (high risk).

Quadrant 2: Increasing social distancing, increasing infection rate. No states fell in this quadrant which suggests a strong correlation between social distancing interventions and either neutral or decreasing

infection rates. States in this quadrant would suggest a disconnect or ineffectiveness of social distancing parameters, and risk would be uncertain.

Quadrant 3: Decreasing social distancing, decreasing infection rate. These are states that are most likely “in the clear”, meaning they have successfully undergone a social distancing intervention (NPI) and are now both exiting strict social distancing parameters and still seeing decreasing infection rates. These states are considered low to medium risk. Since most US sates fell in this quadrant, this suggests that for the most part, the US is currently experiencing low to medium risk in terms of COVID-19 resurgence. However, these states could be at risk of a resurgence if social distancing measures reduce beyond current containment levels.

Quadrant 4: Increasing social distancing, decreasing infection rate. These are medium to high risk states that are still currently enacting, or have recently enacted, strict social distancing policies that are still taking in effect in the population. States in this quadrant most likely have noticed recent upticks in transmission rates and are now responding accordingly by increasing social distancing.

Distribution of states within quadrants where risk is risk of a resurgence in COVID-19 infections:

Quadrant 1: High Risk States – Increasing Infection Rate, Decreasing Social Distancing

Alaska	Nevada
Arkansas	North Dakota
Florida	Oklahoma
Idaho	Tennessee
Louisiana	Wyoming
Montana	

Quadrant 2: Risk unknown

N/A – 0 states

Quadrant 3: Low/Medium Risk – Decreasing Infection Rate, Decreasing Social Distancing

Alabama	Kansas	Ohio	West Virginia
Arizona	Kentucky	Oregon	Wisconsin
California	Maine	Pennsylvania	
Colorado	Maryland	Rhode Island	
Connecticut	Michigan	South Carolina	
Delaware	Mississippi	South Dakota	
Georgia	Missouri	Texas	
Hawaii	Nebraska	Utah	
Illinois	New Jersey	Vermont	
Indiana	New Mexico	Virginia	
Iowa	North Carolina	Washington	

Quadrant 4: Low/Medium Risk – Decreasing Infection Rate, Increasing Social Distancing

District of Columbia
Massachusetts
Minnesota
New Hampshire
New York

Discussion/Conclusions

Social distancing interventions, a class of non-pharmaceutical public health interventions, are rarely used but potentially effective interventions in the case of epidemic or pandemic scenarios. Although preliminary data, these data suggest that there is a correlation between social distancing interventions (e.g., stay-at-home orders) and reducing COVID-19 infection rates. In this study, I use these data to develop a theoretical framework (Figure 5), and examine the position of US states in that framework in terms of their social distancing and infection rate status (a hypothetical “social-distancing space”). The identification of clear “quadrants” that can be used to delineate states into risk segmentation can be used as a useful tool for public health officials both during the current COVID-19 pandemic and perhaps beyond. See a full list of the states in each quadrant in Supplementary Table 2. Further analysis of this data utilizing this theoretical framework might continue to elucidate the underpinnings of a successful public health response during a pandemic. Results here should be considered as exploratory data analysis and can be used as guidance but not in any type of final decision-making process for a public health intervention.

Literature Cited

AdCouncil. Ad Council and Advertising, Media and Marketing Industry Associations Join White House, HHS and CDC to Launch “#StayHome. Save Lives.” Movement in Response to COVID-19 Crisis. April 8th, 2020. <https://www.adcouncil.org/News-Events/Press-Releases/Ad-Council-and-Advertising-Media-and-Marketing-Industry-Associations-Join-White-House-HHS-and-CDC-to-Launch-StayHome.-Save-Lives.-Movement-in-Response-to-COVID-19-Crisis>

Godoy, Maria. Flattening A Pandemic's Curve: Why Staying Home Now Can Save Lives. NPR. March 13th, 2020. <https://www.npr.org/sections/health-shots/2020/03/13/815502262/flattening-a-pandemics-curve-why-staying-home-now-can-save-lives>

Supplementary Materials

Pact	State	5-5-SPI	5-10-Avg	5-12-SPI	5-17-Avg	D-SDI	D-AVG
Non-Pact Stay-At-Home Expiring	Alabama	6.52	3.57	5.22	2.81	-1.3	-0.76
Non-Pact Partial Opener	Alaska	8.22	0.48	7.41	0.62	-0.81	0.14
Non-Pact Stay-At-Home Expiring	Arizona	11.36	4.21	10.12	3.68	-1.24	-0.54
Non-Pact Continued Stay-At-Home	Arkansas	6.19	1.56	4.89	2.52	-1.3	0.96
Western States Pact	California	17.71	3.48	16.86	2.57	-0.85	-0.90
Western States Pact	Colorado	10.98	2.78	9.24	1.77	-1.74	-1.01
Eastern States Pact	Connecticut	17.45	1.93	17.15	1.68	-0.3	-0.25
Eastern States Pact	Delaware	14.83	3.51	14.08	2.83	-0.75	-0.68
	District of Columbia	19.22	3.37	19.94	1.97	0.72	-1.41
Non-Pact Stay-At-Home Expiring	Florida	12.99	1.63	11	1.80	-1.99	0.17
Non-Pact Partial Opener	Georgia	10.09	2.12	8.31	1.90	-1.78	-0.21
	Guam		0.04		0.05		
Non-Pact Continued Stay-At-Home	Hawaii	16.73	0.26	15.47	0.19	-1.26	-0.07
Non-Pact Stay-At-Home Expiring	Idaho	8.83	1.15	7.24	1.36	-1.59	0.21
Midwest States Pact	Illinois	16.16	3.55	15.04	3.22	-1.12	-0.33
Midwest States Pact	Indiana	10.22	3.05	8.82	2.12	-1.4	-0.93
Non-Pact No Stay-At-Home	Iowa	10.06	3.77	9.79	2.98	-0.27	-0.79
Non-Pact Continued Stay-At-Home	Kansas	10.06	5.17	9.95	2.40	-0.11	-2.77
Midwest States Pact	Kentucky	8.78	3.82	7.76	2.99	-1.02	-0.83
Non-Pact Continued Stay-At-Home	Louisiana	7.88	1.15	6.71	1.41	-1.17	0.26
Non-Pact Stay-At-Home Expiring	Maine	7.68	3.17	7.32	2.43	-0.36	-0.75
Non-Pact Continued Stay-At-Home	Maryland	19.57	3.60	19.19	2.61	-0.38	-0.99
Eastern States Pact	Massachusetts	19.22	2.12	19.79	1.60	0.57	-0.53
Midwest States Pact	Michigan	14.04	1.25	13.23	1.19	-0.81	-0.06
Midwest States Pact	Minnesota	11.82	8.33	12.25	4.89	0.43	-3.43
Non-Pact Partial Opener	Mississippi	5.55	3.55	4.42	2.83	-1.13	-0.72
Non-Pact Continued Stay-At-Home	Missouri	9.55	2.10	7.93	1.49	-1.62	-0.61
Non-Pact Partial Opener	Montana	5.61	0.09	5.29	0.39	-0.32	0.30
Non-Pact No Stay-At-Home	Nebraska	10.48	6.11	10.33	3.58	-0.15	-2.54
Western States Pact	Nevada	14.34	1.45	13.51	2.08	-0.83	0.63
Non-Pact Continued Stay-At-Home	New Hampshire	13.77	3.08	14.08	2.39	0.31	-0.69
Eastern States Pact	New Jersey	23.53	1.34	23.49	0.72	-0.04	-0.61
Non-Pact Continued Stay-At-Home	New Mexico	8.62	3.47	8.48	2.90	-0.14	-0.57
Eastern States Pact	New York	20.29	0.86	21.03	0.63	0.74	-0.23
Non-Pact Continued Stay-At-Home	North Carolina	9.4	3.92	8.04	3.63	-1.36	-0.29
Non-Pact No Stay-At-Home	North Dakota	8.58	3.63	8.24	4.02	-0.34	0.39
	Northern Mariana Islands		2.76		2.11		
Midwest States Pact	Ohio	10.74	2.97	10.12	2.08	-0.62	-0.89

Non-Pact Partial Opener	Oklahoma	6.28	2.12	5.75	2.57	-0.53	0.45
Western States Pact	Oregon	13.13	2.75	11.39	1.91	-1.74	-0.84
Eastern States Pact	Pennsylvania	15.12	2.05	14.69	1.50	-0.43	-0.56
	Puerto Rico		3.01		2.80		
Eastern States Pact	Rhode Island	16.73	2.63	15.99	1.66	-0.74	-0.97
Non-Pact Partial Opener	South Carolina	7.39	2.20	5.52	2.14	-1.87	-0.06
Non-Pact No Stay-At-Home	South Dakota	7.42	4.97	7.02	1.84	-0.4	-3.13
Non-Pact Partial Opener	Tennessee	6.97	1.92	5.1	2.21	-1.87	0.29
Non-Pact Stay-At-Home Expiring	Texas	11.62	3.23	9.67	3.15	-1.95	-0.08
Non-Pact No Stay-At-Home	Utah	11.55	2.76	9.52	2.12	-2.03	-0.64
Non-Pact Continued Stay-At-Home	Vermont	11.03	0.42	10.86	0.17	-0.17	-0.25
	Virgin Islands		0.90		0.00		
Non-Pact Continued Stay-At-Home	Virginia	14.96	3.56	13.85	3.44	-1.11	-0.13
Western States Pact	Washington	15.67	2.24	13.61	1.20	-2.06	-1.04
Non-Pact Continued Stay-At-Home	West Virginia	7.52	1.93	6.48	1.44	-1.04	-0.50
Midwest States Pact	Wisconsin	10.72	3.83	10.37	3.50	-0.35	-0.33
Non-Pact No Stay-At-Home	Wyoming	6.27	1.85	5.95	2.07	-0.32	0.22

Supplementary Table 1.

Pact	State	D-SPI	D-AVG	Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4
Non-Pact Stay-At-Home Expiring	Alabama	-1.3	-0.76	0.00	0.00	1.00	0.00
Non-Pact Partial Opener	Alaska	-0.81	0.14	1.00	0.00	0.00	0.00
Non-Pact Stay-At-Home Expiring	Arizona	-1.24	-0.54	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	Arkansas	-1.3	0.96	1.00	0.00	0.00	0.00
Western States Pact	California	-0.85	-0.90	0.00	0.00	1.00	0.00
Western States Pact	Colorado	-1.74	-1.01	0.00	0.00	1.00	0.00
Eastern States Pact	Connecticut	-0.3	-0.25	0.00	0.00	1.00	0.00
Eastern States Pact	Delaware	-0.75	-0.68	0.00	0.00	1.00	0.00
	District of Columbia	0.72	-1.41	0.00	0.00	0.00	1.00
Non-Pact Stay-At-Home Expiring	Florida	-1.99	0.17	1.00	0.00	0.00	0.00
Non-Pact Partial Opener	Georgia	-1.78	-0.21	0.00	0.00	1.00	0.00
	Guam			0.00	0.00	0.00	0.00
Non-Pact Continued Stay-At-Home	Hawaii	-1.26	-0.07	0.00	0.00	1.00	0.00
Non-Pact Stay-At-Home Expiring	Idaho	-1.59	0.21	1.00	0.00	0.00	0.00
Midwest States Pact	Illinois	-1.12	-0.33	0.00	0.00	1.00	0.00
Midwest States Pact	Indiana	-1.4	-0.93	0.00	0.00	1.00	0.00
Non-Pact No Stay-At-Home	Iowa	-0.27	-0.79	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	Kansas	-0.11	-2.77	0.00	0.00	1.00	0.00
Midwest States Pact	Kentucky	-1.02	-0.83	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	Louisiana	-1.17	0.26	1.00	0.00	0.00	0.00
Non-Pact Stay-At-Home Expiring	Maine	-0.36	-0.75	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	Maryland	-0.38	-0.99	0.00	0.00	1.00	0.00
Eastern States Pact	Massachusetts	0.57	-0.53	0.00	0.00	0.00	1.00
Midwest States Pact	Michigan	-0.81	-0.06	0.00	0.00	1.00	0.00
Midwest States Pact	Minnesota	0.43	-3.43	0.00	0.00	0.00	1.00
Non-Pact Partial Opener	Mississippi	-1.13	-0.72	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	Missouri	-1.62	-0.61	0.00	0.00	1.00	0.00
Non-Pact Partial Opener	Montana	-0.32	0.30	1.00	0.00	0.00	0.00
Non-Pact No Stay-At-Home	Nebraska	-0.15	-2.54	0.00	0.00	1.00	0.00
Western States Pact	Nevada	-0.83	0.63	1.00	0.00	0.00	0.00
Non-Pact Continued Stay-At-Home	New Hampshire	0.31	-0.69	0.00	0.00	0.00	1.00
Eastern States Pact	New Jersey	-0.04	-0.61	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	New Mexico	-0.14	-0.57	0.00	0.00	1.00	0.00
Eastern States Pact	New York	0.74	-0.23	0.00	0.00	0.00	1.00
Non-Pact Continued Stay-At-Home	North Carolina	-1.36	-0.29	0.00	0.00	1.00	0.00
Non-Pact No Stay-At-Home	North Dakota	-0.34	0.39	1.00	0.00	0.00	0.00
	Northern Mariana Islands			0.00	0.00	0.00	0.00
Midwest States Pact	Ohio	-0.62	-0.89	0.00	0.00	1.00	0.00
Non-Pact Partial Opener	Oklahoma	-0.53	0.45	1.00	0.00	0.00	0.00
Western States Pact	Oregon	-1.74	-0.84	0.00	0.00	1.00	0.00

Eastern States Pact	Pennsylvania	-0.43	-0.56	0.00	0.00	1.00	0.00
	Puerto Rico			0.00	0.00	0.00	0.00
Eastern States Pact	Rhode Island	-0.74	-0.97	0.00	0.00	1.00	0.00
Non-Pact Partial Opener	South Carolina	-1.87	-0.06	0.00	0.00	1.00	0.00
Non-Pact No Stay-At-Home	South Dakota	-0.4	-3.13	0.00	0.00	1.00	0.00
Non-Pact Partial Opener	Tennessee	-1.87	0.29	1.00	0.00	0.00	0.00
Non-Pact Stay-At-Home Expiring	Texas	-1.95	-0.08	0.00	0.00	1.00	0.00
Non-Pact No Stay-At-Home	Utah	-2.03	-0.64	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	Vermont	-0.17	-0.25	0.00	0.00	1.00	0.00
	Virgin Islands			0.00	0.00	0.00	0.00
Non-Pact Continued Stay-At-Home	Virginia	-1.11	-0.13	0.00	0.00	1.00	0.00
Western States Pact	Washington	-2.06	-1.04	0.00	0.00	1.00	0.00
Non-Pact Continued Stay-At-Home	West Virginia	-1.04	-0.50	0.00	0.00	1.00	0.00
Midwest States Pact	Wisconsin	-0.35	-0.33	0.00	0.00	1.00	0.00
Non-Pact No Stay-At-Home	Wyoming	-0.32	0.22	1.00	0.00	0.00	0.00

Supplementary Table 2.