

Institutional Origins of Protective COVID-19 Public Health Policy Responses: Informational and Authority Redundancies and Policy Stringency: Supplementary Information

S1: List of Countries

Algeria
Argentina
Australia
Austria
Bangladesh
Belgium
Bhutan
Bolivia
Brazil
Canada
Chile
China
Colombia
Costa Rica
Croatia
Czech Republic
Denmark
Ecuador
Egypt
El Salvador
Finland
France
Germany
Guatemala
Honduras
Hungary
India
Ireland
Israel
Italy
Jordan
Kenya
Kuwait
Lebanon
Mexico
Montenegro
Nepal
Netherlands

New Zealand
Nicaragua
Norway
Oman
Pakistan
Panama
Paraguay
Peru
Poland
Portugal
Qatar
Romania
Saudi Arabia
Slovenia
South Africa
Spain
Sri Lanka
Sweden
Switzerland
Turkey
United Arab Emirates
United Kingdom
United States
Uruguay
Venezuela
Yemen

S2: Public health policy categories in PPI

Category ¹	Var_name	Values	Max. value in category	Weight in index, %
1. International and domestic air borders closure	air_bord	All air borders are closed (3)	3	7.5
		All international air borders are closed (2)		
		Air borders with select countries are closed (1)		
		All air borders are open (0)		
2. International and domestic land borders closure	land_bord	All land borders are closed (3)	3	7.5
		All international land borders are closed (2)		
		Land borders with select countries are closed (1)		
		All land borders are open (0)		
3. International and domestic sea borders closure	sea_bord	All sea borders are closed (3)	3	7.5
		All international sea borders are closed (2)		
		Sea borders with select countries are closed (1)		
		All sea borders are open (0)		
4. Limits on size of social gatherings	soc_gath	All social gatherings are prohibited (4)	4	10
		Social gatherings of 10 and more people are prohibited (3)		
		Social gatherings of 50 and more people are prohibited (2)		
		Social gatherings of 100 and more people are prohibited (1)		
		Social gatherings are not restricted (0)		
5. Closing of schools	schools	Full closure of K12 schools (4)	4	10
		Partial closure of K12 schools (2)		

¹ Because of their singular presence and in fact, feasibility, in but a few out of our sample of 62 countries, some public health measures that drew attention in the US or in European nations (e.g., closing of nurseries, closing of nursing homes, etc.) are not included in the global PPI.

		K12 schools are not required to close (0)		
6. State of emergency	emerg	State of emergency (3)	3	7.5
		No state of emergency (0)		
7. Closure of entertainment venues /stadiums	venues	Closure of entertainment venues /stadiums (1)	1	2.5
		Entertainment venues /stadiums are not required to close (0)		
8. Closure of restaurants	restrts	Restaurants are closed except for take-out and delivery (2)	2	5
		The operation of restaurants is not restricted (0)		
9. Closure of non-essential businesses	ne_busn	Non-essential businesses are required to close (2)	2	5
		The operation of non-essential businesses is not restricted (0)		
10. Closure of government offices	gov_offs	Government offices are closed for public (2)	2	5
		Government offices are open (0)		
11. Working from home requirement for businesses/org anizations	wfh	Working from home requirement (1)	1	2.5
		No working from home requirement (0)		
12. Personal mobility restrictions	ind_mob	Residents require a pass to leave home (5)	5	12.5
		Residents are to stay at home except for essential needs (4)		
		Curfew (1)		
		No restrictions on leaving home (0)		
13. Self-isolation and/or quarantine requirements	med_stay	Mandatory quarantine for specific categories of residents (3)	2	5
		Quarantine is advised for specific categories of residents (1)		
		No policies require quarantine (0)		
14. Public transportation closures	publ_tr	Public transportation is closed (2)	2	5
		The operation of public transportation is not restricted (0)		

15. Mandatory wearing of PPE/ masks	masks	Wearing of masks and other PPE is required (2)	3	7.5
		Wearing of masks and other PPE is not required (0)		
Total			40	100

S3: Protective Public Health Policies of National Origin

DATE - 3/1/2020

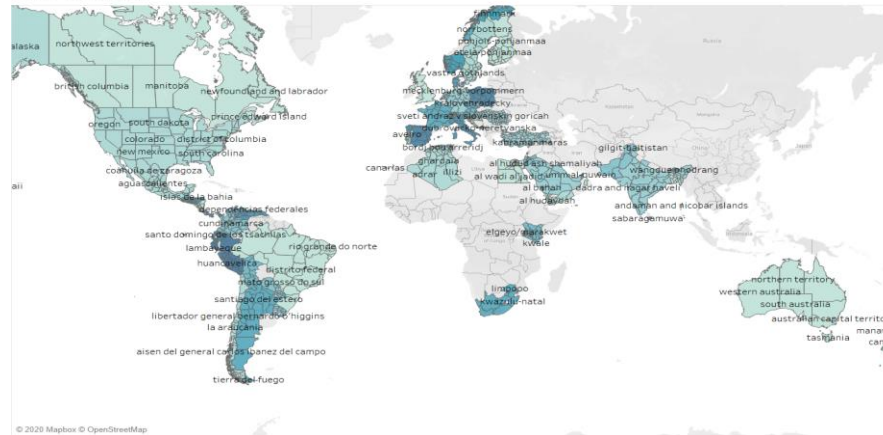


Map based on Longitude (generated) and Latitude (generated). Color shows Index Nat as an attribute. The marks are labeled by Name. Details are shown for ISO Country.

Index Nat.

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DATE - 3/15/2020

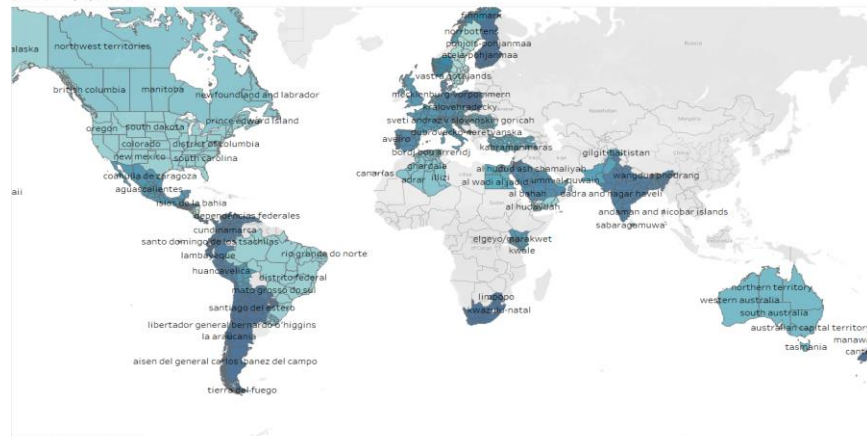


Map based on Longitude (generated) and Latitude (generated). Color shows Index Nat as an attribute. The marks are labeled by Name. Details are shown for ISO Country.

Index Nat

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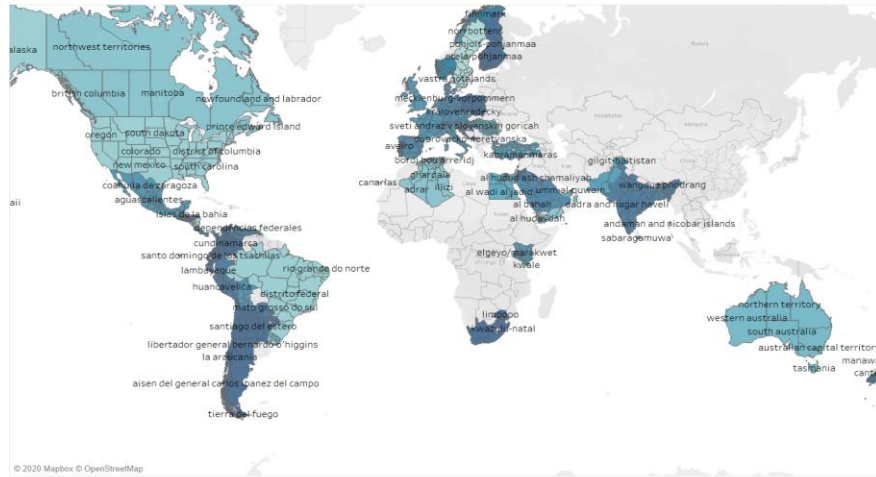
DATE - 4/1/2020



Map based on Longitude (generated) and Latitude (generated). Color shows Index Nat as an attribute. The marks are labeled by Name. Details are shown for ISO Country.

Index Nat

DATE - 4/15/2020



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Index Nat



DATE - 4/24

DATE - 4/24/2020



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Map based on Longitude (generated) and Latitude (generated). Color shows Index Nat as an attribute. The marks are labeled by Name. Details are shown for ISO Country.

Index Nat

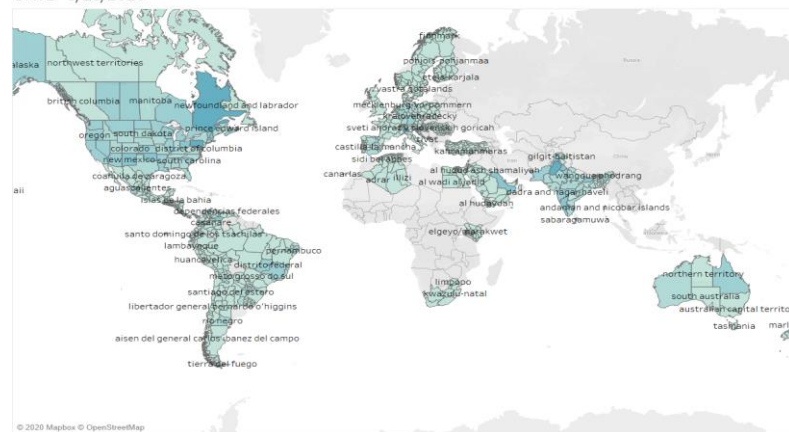


S4: Protective Public Health Policies of Subnational Origin

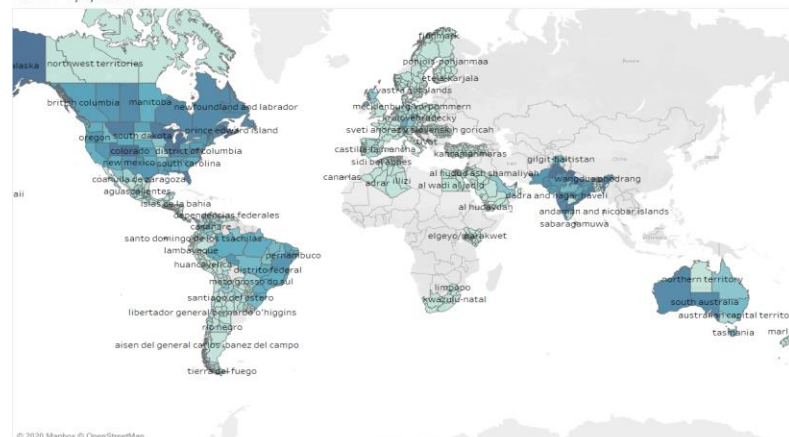
DATE - 3/1/2020



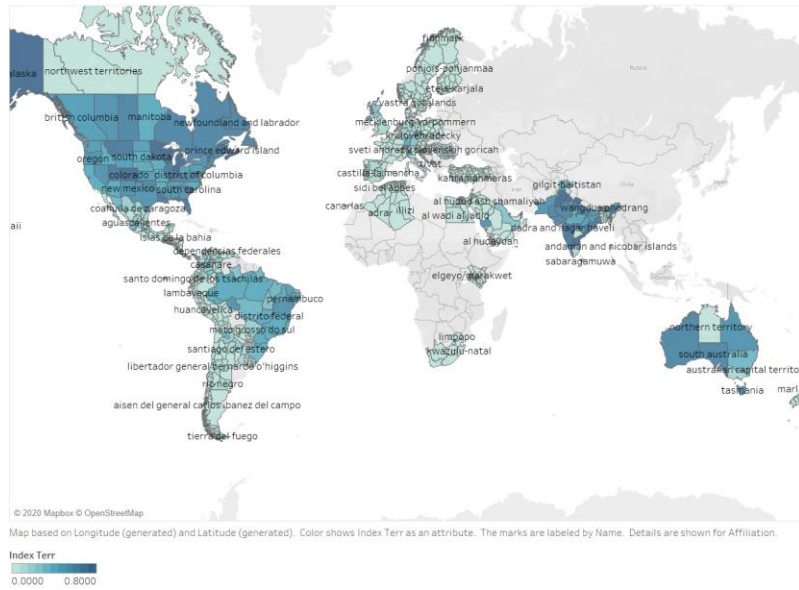
DATE - 3/15/2020



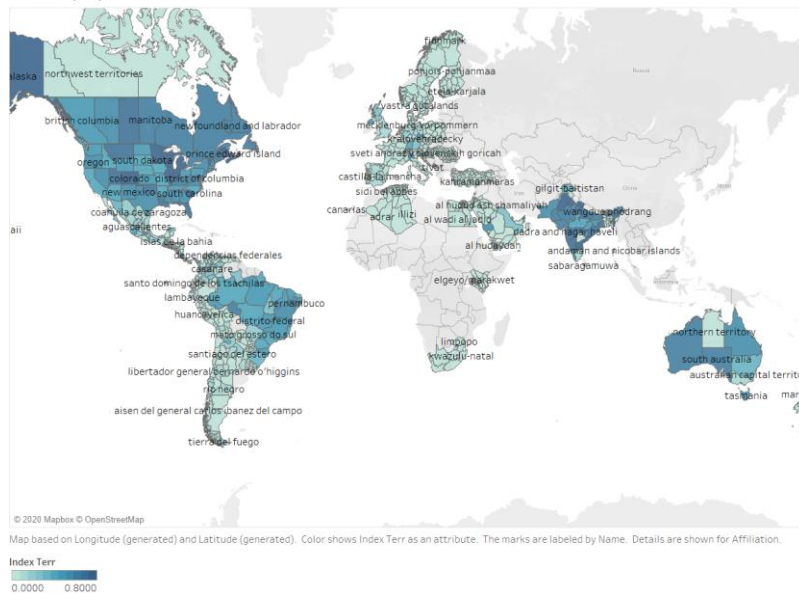
DATE - 4/1/2020



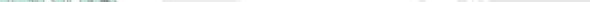
DATE - 4/15/2020



DATE - 4/24/2020



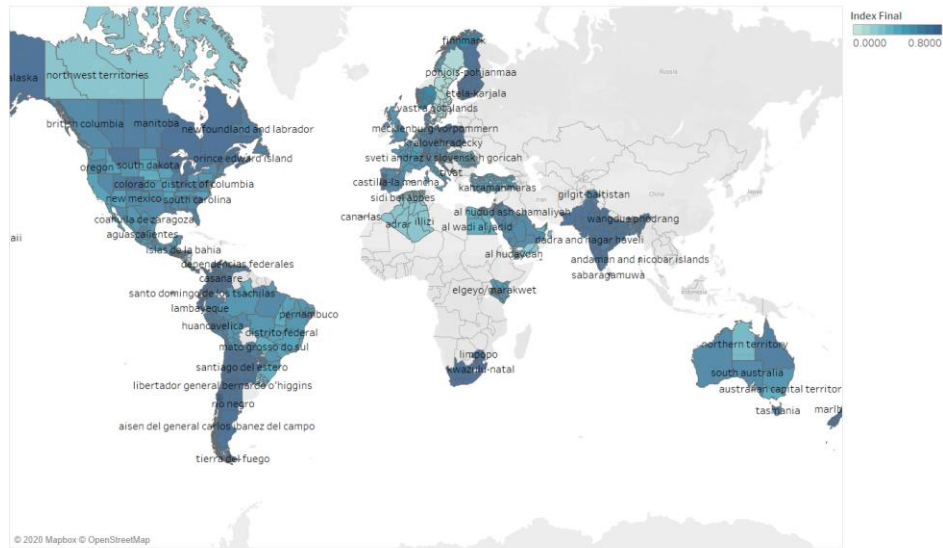
DATE - 3/1/2020



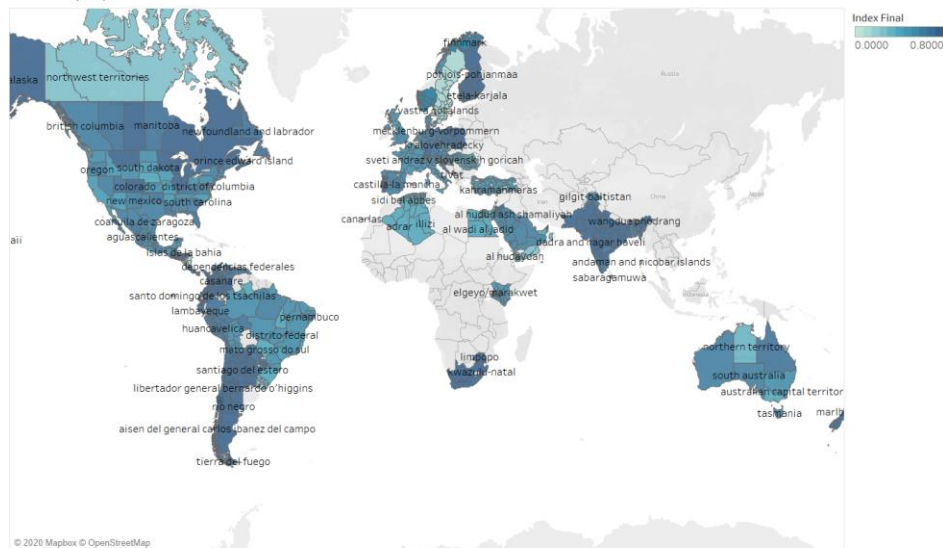
DATE - 4/1/2020



DATE - 4/15/2020



DATE - 4/24/2020



S6: Additional estimates

V-Dem Indicators and Average PPI on March 15, 2020, OLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
V-Dem Polyarchy	0.097 (0.079)	0.319** (0.149)	0.369* (0.203)			
V-Dem Liberal Democracy				0.064 (0.083)	0.262 (0.162)	0.268 (0.199)
COVID cases (1 week prior)		0.002* (0.001)	0.002* (0.001)		0.002* (0.001)	0.002 (0.001)
Ages 65 and above		-0.011 (0.007)	-0.013* (0.008)		-0.008 (0.007)	-0.010 (0.007)
(ln) Population density		0.022 (0.016)	0.030* (0.016)		0.020 (0.016)	0.029* (0.017)
(ln) Healthcare spending		-0.012 (0.019)	0.007 (0.058)		-0.019 (0.019)	0.021 (0.058)
(ln) GDP per capita			-0.006 (0.083)			-0.035 (0.077)
Globalization			-0.000 (0.001)			-0.000 (0.001)
Number of doctors			-0.000 (0.003)			-0.001 (0.003)
Constant	0.205*** (0.049)	0.156 (0.156)	0.071 (0.562)	0.232*** (0.045)	0.249* (0.146)	0.343 (0.497)
R-squared	0.020	0.127	0.170	0.009	0.098	0.141
Obs	63	61	60	63	61	60

Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p< 0.01 for two-tailed tests.

V-Dem Indicators and Average PPI on April 1, 2020, OLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
V-Dem Polyarchy	0.200** (0.099)	0.458*** (0.158)	0.439* (0.248)			
V-Dem Liberal Democracy				0.172* (0.099)	0.482*** (0.172)	0.452* (0.239)
COVID cases (1 week prior)		-0.000 (0.000)	-0.000 (0.000)		-0.000 (0.000)	-0.000 (0.000)
Ages 65 and above		-0.010 (0.007)	-0.010 (0.008)		-0.009 (0.007)	-0.009 (0.008)
(ln) Population density		0.003 (0.022)	0.016 (0.024)		0.004 (0.022)	0.017 (0.024)
(ln) Healthcare spending		-0.021 (0.025)	0.014 (0.069)		-0.035 (0.027)	0.012 (0.069)
(ln) GDP per capita			-0.014 (0.104)			-0.029 (0.095)
Globalization			-0.001 (0.001)			-0.001 (0.001)
Number of doctors			-0.001 (0.004)			-0.002 (0.004)
Constant	0.423*** (0.068)	0.505** (0.223)	0.455 (0.740)	0.459*** (0.058)	0.625*** (0.214)	0.648 (0.628)
R-squared	0.066	0.130	0.174	0.052	0.132	0.183
Obs	63	61	60	63	61	60

Robust standard errors in parentheses. * p<0.1 ** p<0.05 *** p< 0.01 for two-tailed tests.

V-Dem Indicators and the Dynamics of Average PPI, Arellano-Bond Estimates

	(7)	(8)	(9)	(10)	(11)	(12)
V-Dem Liberal Democracy	.0052** (.0025)	.0113*** (.0038)	.0109** (.0051)			
V-Dem Polyarchy				.0057** (.0025)	.0107*** (.0036)	.0106* (.0054)
PPI (lagged)	.993*** (.0061)	.993*** (.0062)	.993*** (.0064)	.993*** (.006)	.993*** (.0063)	.993*** (.0064)
Cases per mln	7.2e-05 (1.4e-04)	5.0e-05 (1.4e-04)	4.8e-05 (1.4e-04)	7.6e-05 (1.4e-04)	5.2e-05 (1.4e-04)	5.0e-05 (1.4e-04)
Cases per mln (lagged)	-4.7e-05 (2.8e-04)	-1.6e-05 (2.8e-04)	-1.4e-05 (2.8e-04)	-5.0e-05 (2.7e-04)	-1.7e-05 (2.8e-04)	-1.5e-05 (2.8e-04)
Cases per mln (lagged twice)	-4.2e-05 (1.5e-04)	-5.0e-05 (1.5e-04)	-4.9e-05 (1.5e-04)	-4.3e-05 (1.5e-04)	-5.0e-05 (1.5e-04)	-5.0e-05 (1.5e-04)
Ages 65 and above		-1.9e-04 (1.6e-04)	-2.0e-04 (1.8e-04)		-2.1e-04 (1.7e-04)	-2.2e-04 (1.8e-04)
(ln) Population density		9.9e-05 (4.6e-04)	4.0e-04 (4.7e-04)		1.2e-04 (4.7e-04)	4.0e-04 (4.8e-04)
(ln) Healthcare spending		-7.2e-04 (5.5e-04)	3.5e-04 (.0015)		-3.5e-04 (5.3e-04)	4.2e-04 (.0015)
(ln) GDP per capita			-6.5e-04 (.0021)			-3.1e-04 (.0023)
Globalization			-1.5e-05 (1.6e-05)			-1.4e-05 (1.6e-05)
Number of doctors			-4.3e-05 (9.1e-05)			-3.5e-05 (9.0e-05)
Constant	.0109*** (.0019)	.0143*** (.005)	.0146 (.0143)	.0101*** (.002)	.0112** (.0052)	.0097 (.0168)
Wald Chi-squared	150962.6	167340.9	197957.6	149520.4	175744.0	203036.3
p	0.000	0.000	0.000	0.000	0.000	0.000
N	2835	2745	2700	2835	2745	2700
N groups	63	61	60	63	61	60
AR(1) test	-5.787	-5.677	-5.649	-5.787	-5.678	-5.649
p	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test	-0.794	-0.767	-0.577	-0.793	-0.767	-0.577
p	0.427	0.443	0.564	0.428	0.443	0.564

Robust standard errors in parentheses (adjusted for clusters by country). * p<0.1 ** p<0.05 *** p< 0.01 for two-tailed tests.

PPI and the number of COVID cases per mln are treated as endogenous.

The sample is limited to the period between February 15 and April 30 to accommodate the requirements of the Arellano-Bond model. Estimated with xtabond2 (Roodman 2009)

Regional Autonomy and Regional, National, and Total Average PPI, multivariate linear regression estimates, Free or Partly Free

March 15

	(1)		(2)		(3)	
	Regional	National	Regional	National	Regional	National
Self-rule component of RAI	0.004*** (0.001)	0.001 (0.003)	0.004*** (0.001)	0.001 (0.004)	0.004*** (0.001)	0.001 (0.004)
COVID cases (lagged 1 week)			-0.000 (0.000)	0.002 (0.002)	-0.000 (0.000)	0.002 (0.002)
Ages 65 and above			-0.002 (0.002)	-0.010 (0.007)	-0.001 (0.003)	-0.010 (0.009)
(ln) Population density			0.000 (0.007)	0.020 (0.022)	0.003 (0.007)	0.021 (0.023)
(ln) Healthcare spending			0.005 (0.009)	0.013 (0.028)	-0.002 (0.019)	0.038 (0.059)
(ln) GDP per capita					0.023 (0.031)	-0.048 (0.099)
Globalization					-0.000 (0.000)	0.000 (0.001)
Number of doctors					-0.001 (0.001)	-0.000 (0.004)
Constant	-0.014 (0.014)	0.260*** (0.045)	-0.024 (0.066)	0.182 (0.205)	-0.179 (0.204)	0.468 (0.646)
R-squared	0.219	0.001	0.242	0.100	0.273	0.104
Correlation of residuals:						
Regional	1		1		1	
National	0.0172	1	-0.0098	1	-0.0036	1

Number of observations is 52. Standard errors in parentheses. * p<0.1 ** p<0.05 *** p< 0.01 for two-tailed tests.

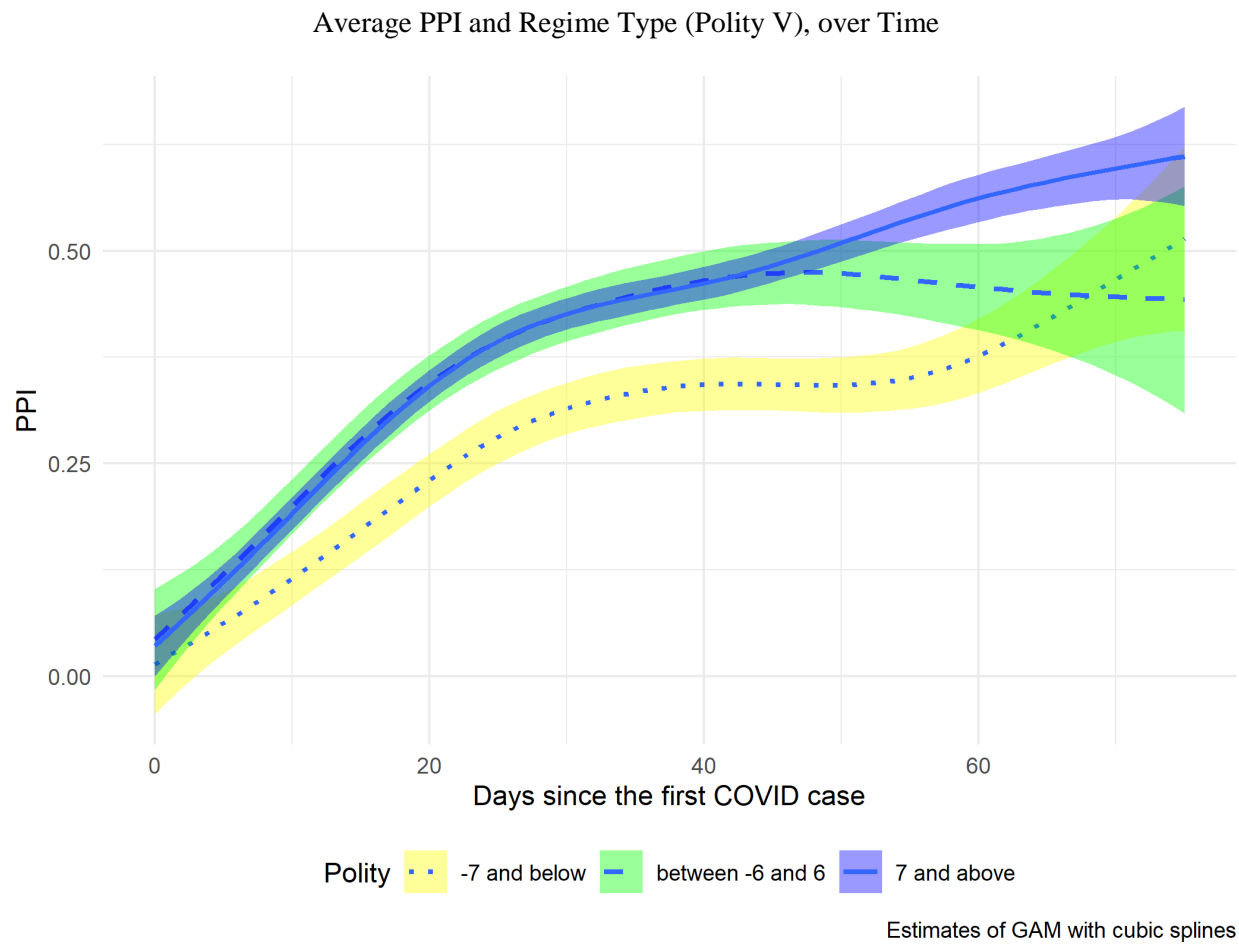
Regional Autonomy and Regional, National, and Total Average PPI, multivariate linear regression
estimates, Free or Partly Free

April 1

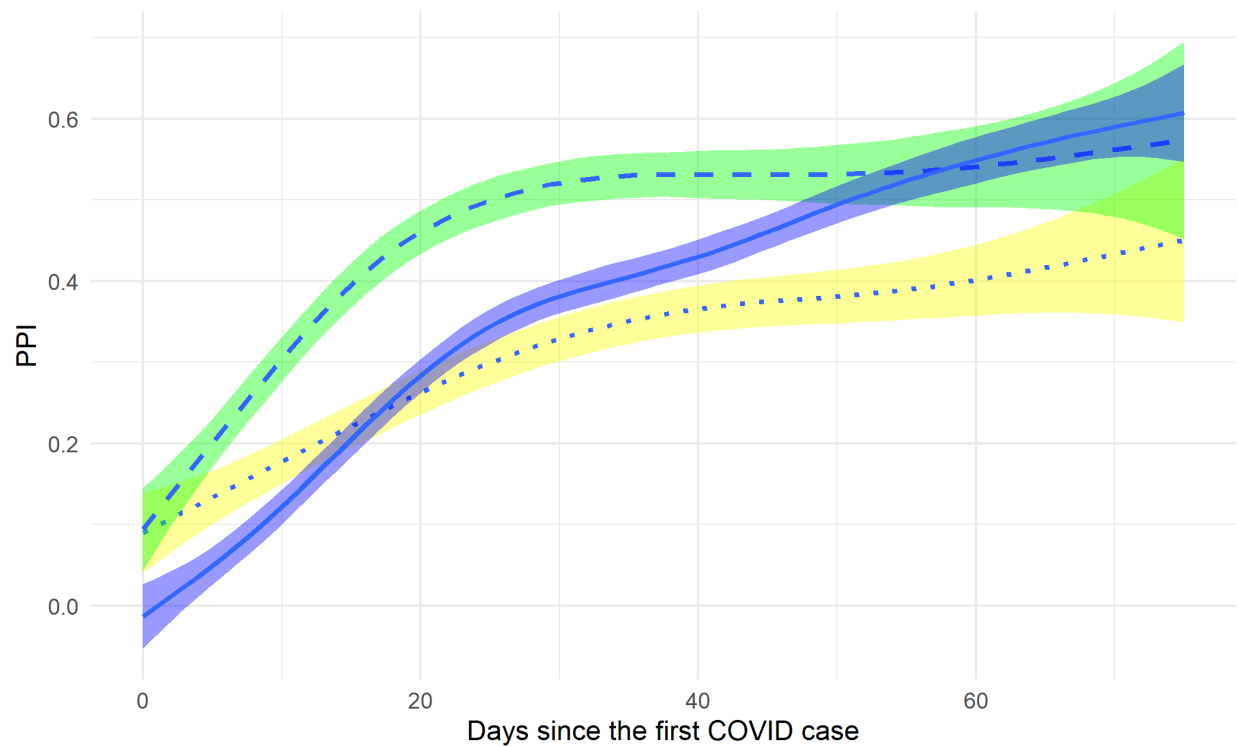
	(4)		(5)		(6)	
	Regional	National	Regional	National	Regional	National
Self-rule component of RAI	0.011***	-0.002	0.014***	-0.001	0.011***	-0.000
	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.005)
COVID cases (lagged 1 week)			-0.000	0.000	-0.000	0.000
			(0.000)	(0.000)	(0.000)	(0.000)
Ages 65 and above			-0.007	-0.003	-0.004	-0.003
			(0.006)	(0.008)	(0.007)	(0.010)
(ln) Population density			-0.003	0.003	0.003	0.007
			(0.019)	(0.026)	(0.020)	(0.027)
(ln) Healthcare spending			0.026	-0.027	0.004	0.047
			(0.025)	(0.033)	(0.050)	(0.068)
(ln) GDP per capita					0.068	-0.148
					(0.083)	(0.112)
Globalization					-0.001	0.000
					(0.001)	(0.001)
Number of doctors					-0.003	0.001
					(0.003)	(0.004)
Constant	-0.039	0.557***	-0.113	0.740***	-0.546	1.622**
	(0.039)	(0.050)	(0.194)	(0.260)	(0.535)	(0.721)
R-squared	0.222	0.004	0.313	0.053	0.352	0.091
Correlation of residuals:						
Regional	1		1		1	
National	-0.2167	1	-0.2470	1	-0.2381	1

Number of observations is 52. Standard errors in parentheses. * p<0.1 ** p<0.05 *** p< 0.01 for two-tailed tests.

S7: Additional and Alternative Charts the Dynamics of PPI



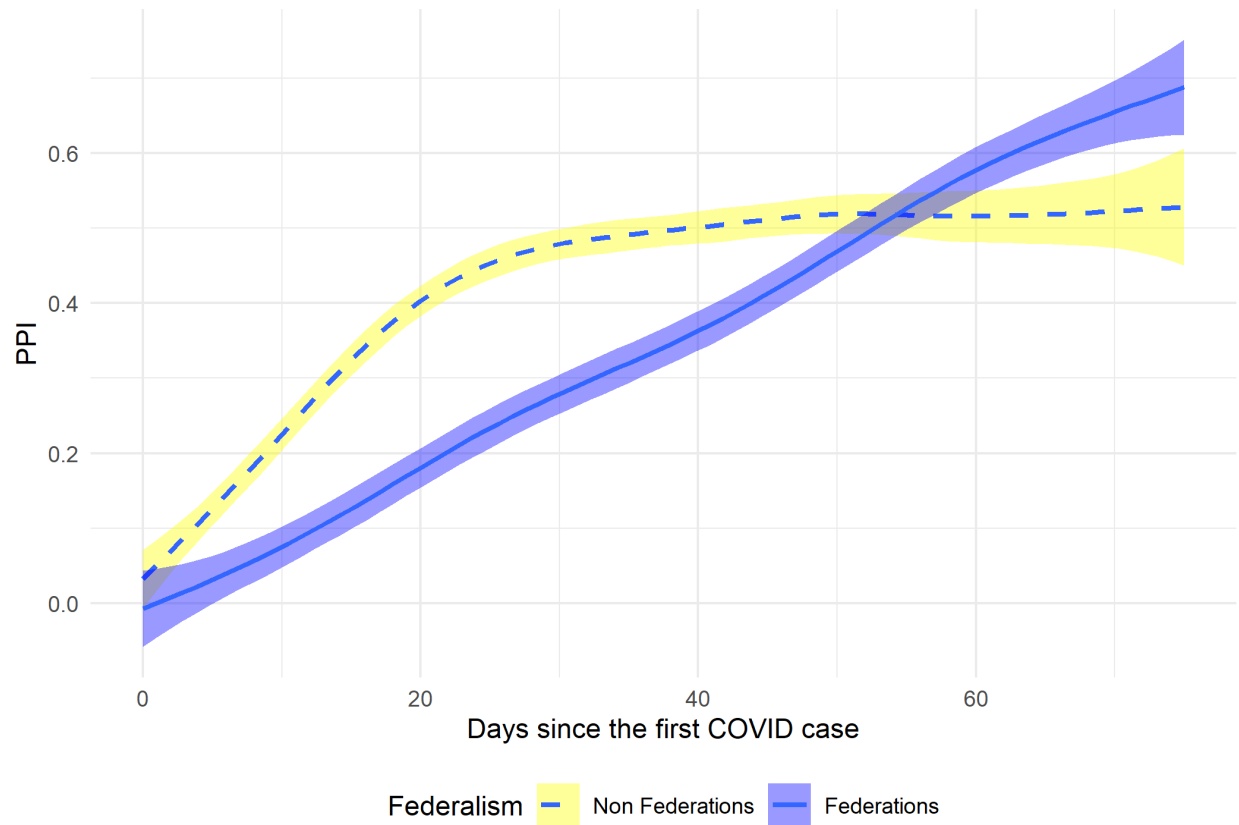
Average PPI and Regime Type (Freedom Status), over Time



FH Status Not Free Partially Free Free

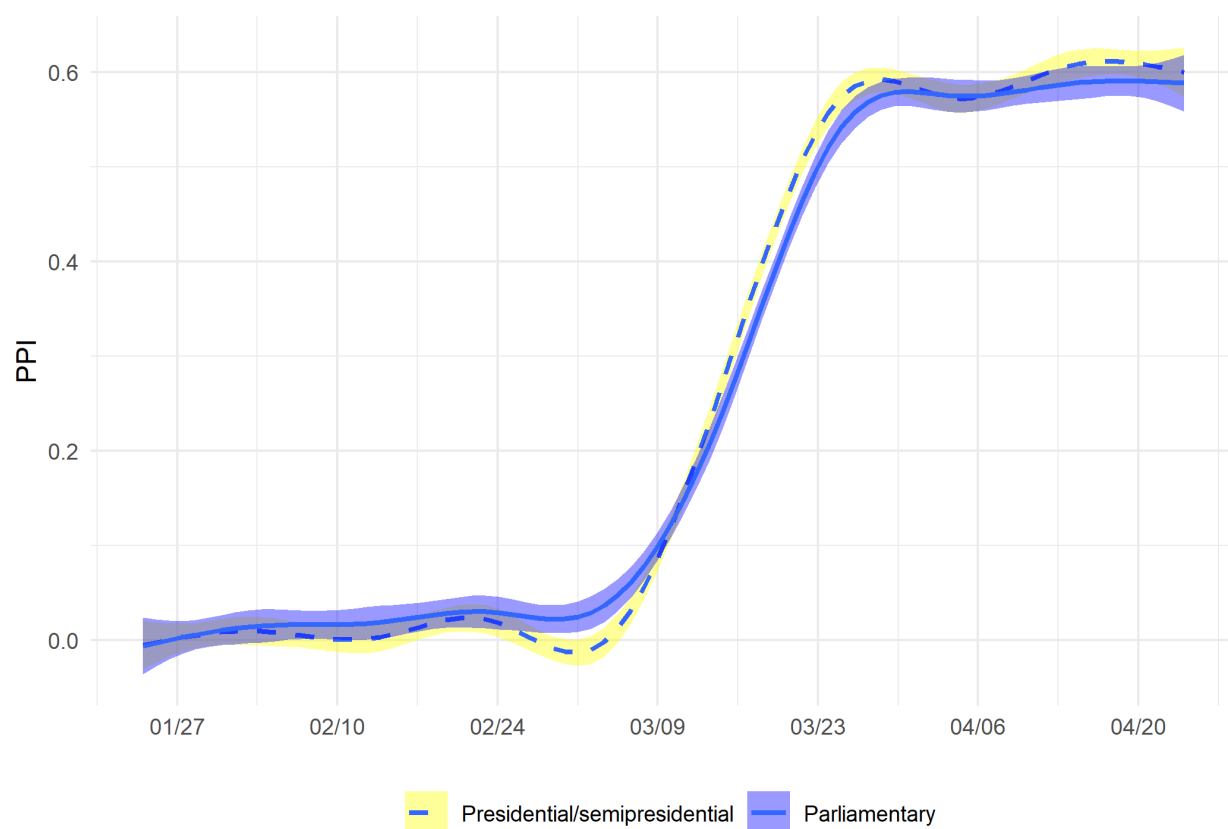
Estimates of GAM with cubic splines

Average PPI and Federalism, over Time, Free or Partly Free



Estimates of GAM with cubic splines; 'not-free' polities are excluded.

Average PPI in Presidential versus Parliamentary Democracies, over Time, Free or Partly Free



Estimates of GAM with cubic splines; 'not-free' polities are excluded.

S8: Comparison of PPI variance

Comparison of PPI variance across regimes

	mean	variance	N	ratio of variances	p-value
March 15					
Free	0.273	0.036	34		
Partly Free	0.303	0.023	19	0.645	0.327
Not Free	0.165	0.021	10	0.580	0.393
April 1					
Free	0.580	0.038	34		
Partly Free	0.573	0.031	19	0.82	0.776
Not Free	0.381	0.041	10	1.10	0.674

Comparison of PPI variance between federations and non-federations

	mean	variance	N	ratio of variances	p-value
March 15					
Federations	0.243	0.013	13		
Not federations	0.297	0.037	40	2.88	0.05
April 1					
Federations	0.628	0.015	13		
Not federations	0.561	0.040	40	2.69	0.069

S9: Cross regional distribution of Total PPI and decentralization

