

COVID-19 containment measures and the public's response

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Motivation and project objective

The COVID-19 pandemic has elicited a wide array of measures from policymakers and political authorities. Among similar types measures, there is heterogeneity in their stringency or their degree of enforcement.

Also, the public responds differently to the different types of measures.

Objectives of this project

- ▶ Group US states according to different strategies of COVID containment.
- ▶ Identify variables that are correlated with each group.
- ▶ Understand the public's response to these measures.

Analyzing COVID-19 US states' measures

Data and Methodology

COVID measures dataset: Oxford Policy Tracker

- ▶ Follows daily levels of 10 types of COVID measures for the 50 US states.
- ▶ Each variable is an integer taking values from zero to three or four.
- ▶ The higher the value, the higher the restrictions/stringency of the implemented policy.

Our methodology

- ▶ Select the period of 30 days before and after the peak number of new deaths,
- ▶ Average the level of response, for each type of variable.
- ▶ Compare this average across states

Categories of measures and measures included

Table 1: Categories and Variable types

Containment	Health	Economic
School Closings Workplace closing Cancel public events Restrictions on gatherings Close public transport Stay at home requirements Restrictions on internal movement International travel controls	Public info campaigns Testing Policy Contact Tracing Emergency investment in healthcare Protection of elderly people Facial coverings Vaccination policy	Income Support Debt relief Fiscal Measures International Support

Descriptive measures

Table 2: Covid measures sample statistics

Measure	N	mean	sd	sample min	sample max	theoretical max
C1_School closing	3100	2.00	0.55	0	3	3
C2_Workplace closing	3100	1.40	0.79	0	3	3
C3_Cancel public events	3100	1.40	0.54	0	2	2
C4_Restrictions on gatherings	3100	3.10	1.40	0	4	4
C5_Close public transport	3100	0.57	0.65	0	2	2
C6_Stay at home requirements	3100	1.00	0.71	0	2	3
C7_Restrictions on internal movement	3100	0.77	0.80	0	2	2
C8_International travel controls	3100	0.54	0.86	0	2	4
E1_Income support	3100	0.72	0.66	0	2	2
E2_Debt/contract relief	3100	1.20	0.75	0	2	2
H1_Public information campaigns	3100	2.00	0.18	1	2	2
H2_Testing policy	3100	2.50	0.62	1	3	3
H3_Contact tracing	3100	1.30	0.52	0	2	2
H6_Facial Coverings	3100	2.60	0.77	0	4	4
H8_Protection of elderly people	3100	2.10	0.80	0	3	3

Understanding types of responses : PCA results

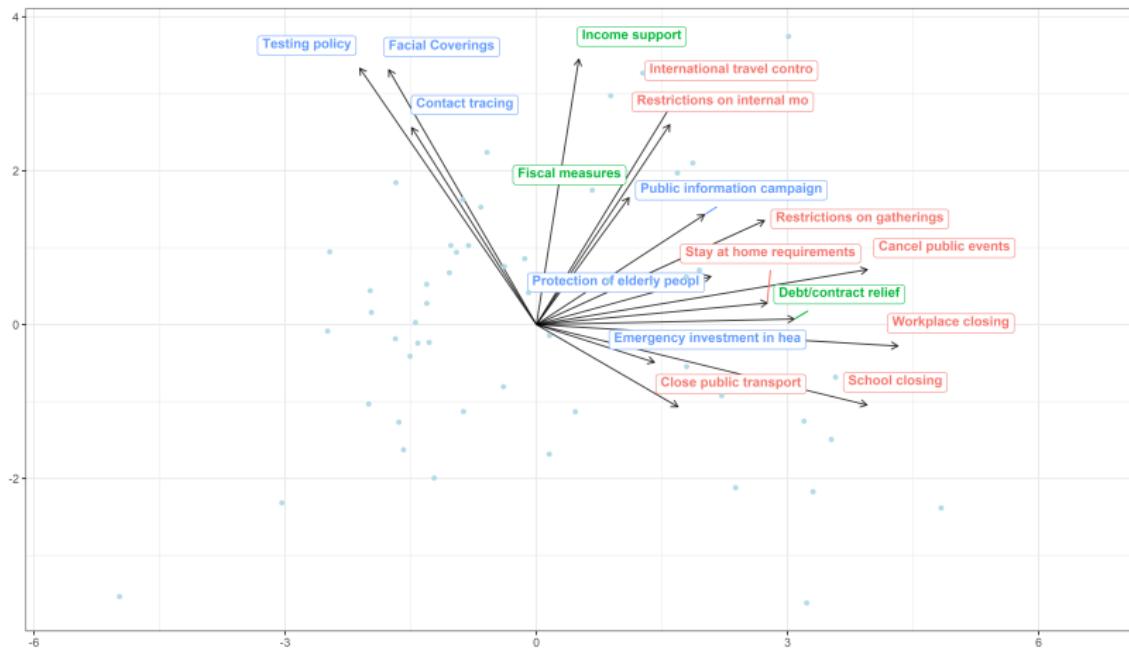


Figure 1: PCA components and original features

Where are US states positioned?

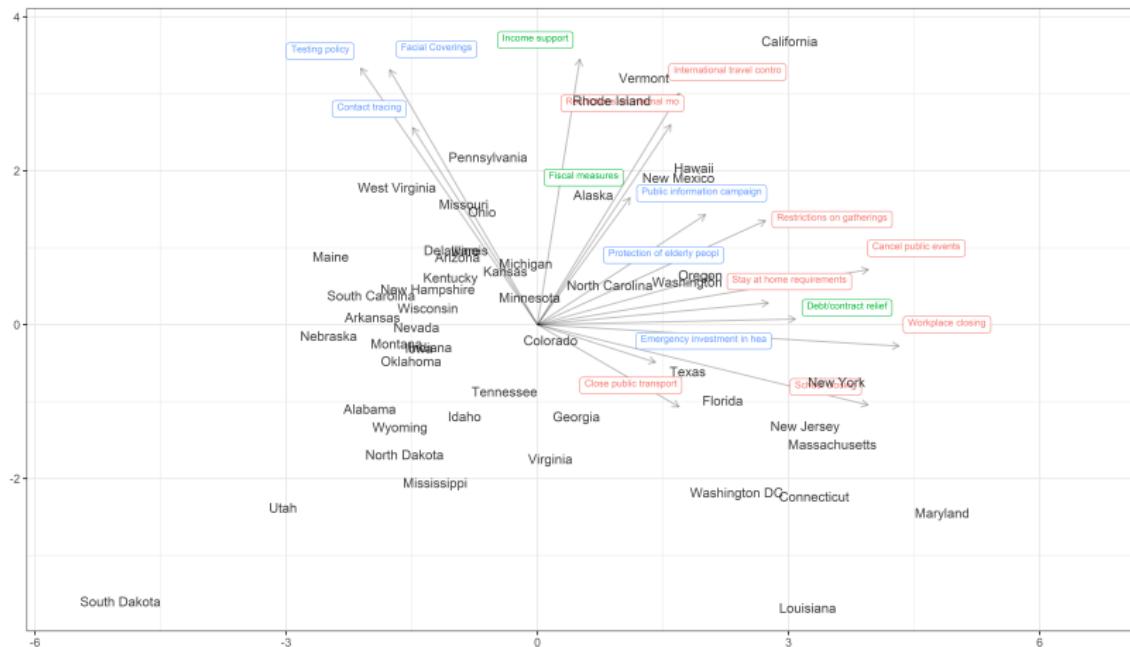


Figure 2: PCA components for USA states

What groups can be identified?



Figure 3: US States clustered by k-means cluster

Is governors' partisanship a good segmenting variable?

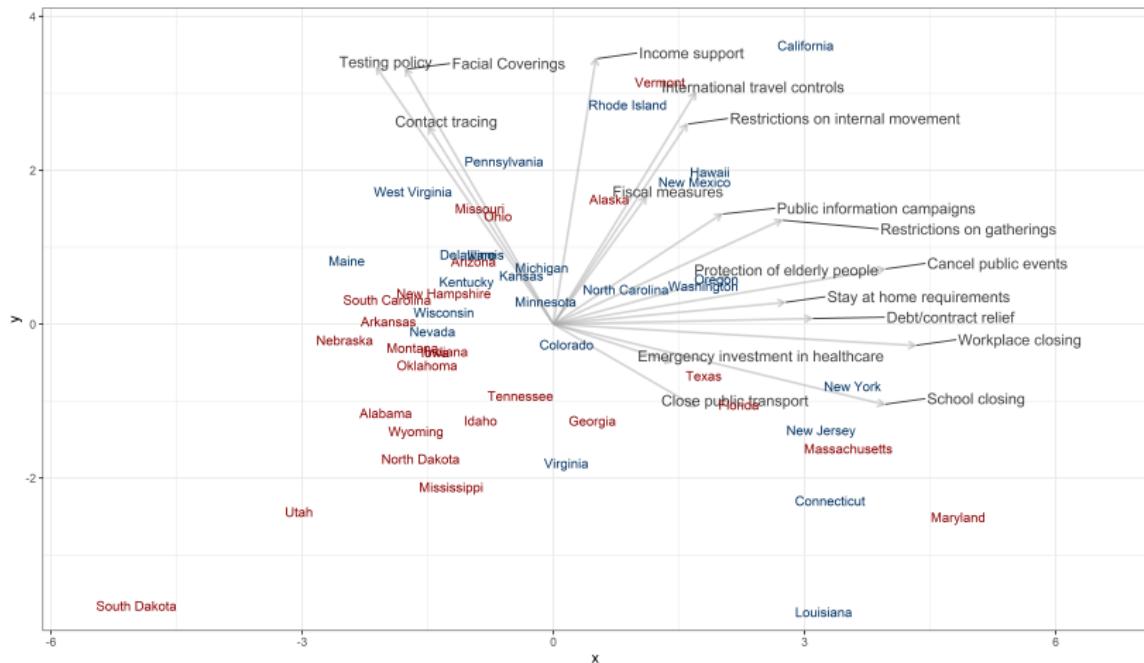


Figure 4: PCA components for USA states. Color is political partisanship of current governor.

Is governors' partisanship a good segmenting variable?

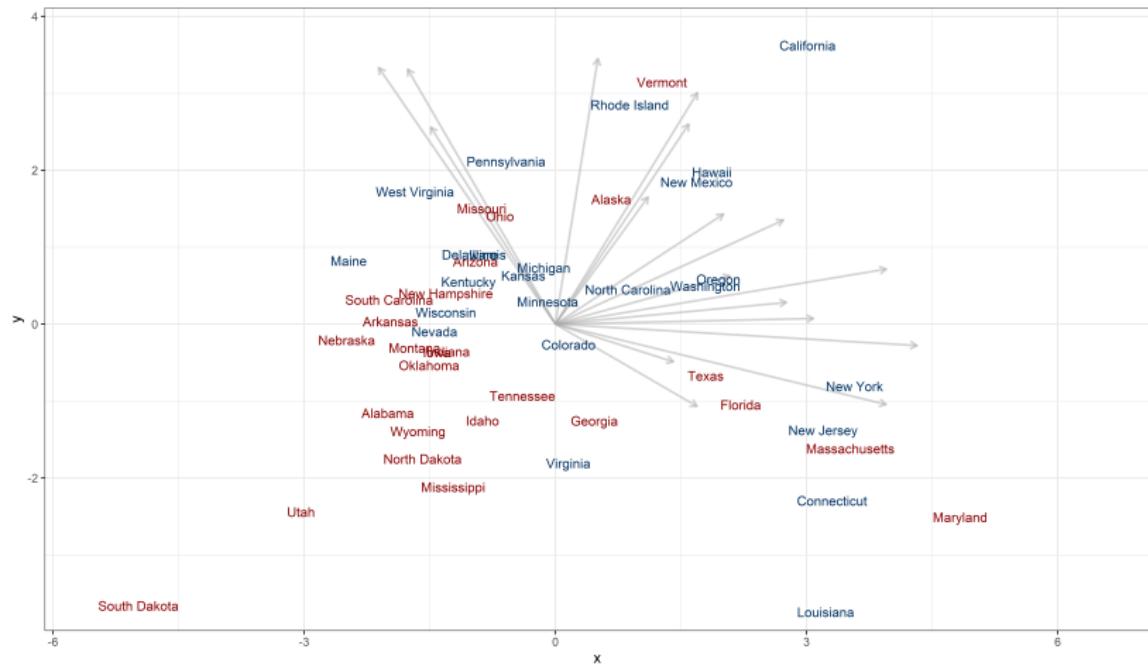


Figure 5: PCA components for USA states. Color is political partisanship of current governor.

Are measures better separated by people's affinities or authorities' partisanship?

- ▶ We are interested in investigating whether people's preferences are a better segmenting variable than governor's partisanship.
- ▶ We leverage the cases where the governor is of the opposite political side of the majority of the population (e.g. A. Schwarzenegger)
- ▶ This leads to the following set of states:

State	Party	Republican Advantage in Population	Leaning
Florida	republican	-5.38	democrat
Kansas	democrat	9.36	republican
Maine	democrat	9.14	republican
Maryland	republican	-22.24	democrat
Massachusetts	republican	-10.87	democrat
Oklahoma	republican	-5.25	democrat
Vermont	republican	-10.29	democrat

In general, segmentation improves

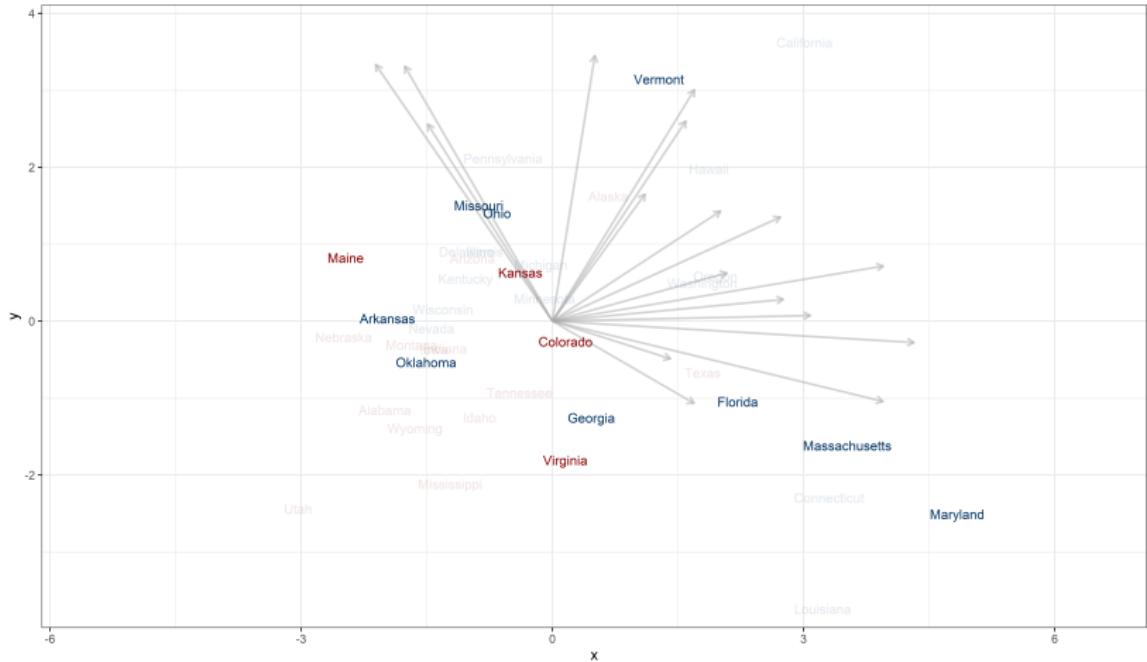


Figure 6: States that change group after considering population's political leaning

Summary

- ▶ In general we observe states grouped by the types of measures taken during the peak period of the pandemic.
- ▶ Political partizanship of authorities can be a good segmenting variable in the space of measures taken.
- ▶ Grouping by the political leaning of the population in general improves the previous segmentation, especially for heavy democrat states like Vermont, Maryland and Massachusetts.

Analysis of public's response: tweets