The rise of COVID-19 cases is associated with support for world leaders

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COVID-19 has emerged as one of the deadliest and most disruptive events in recent human history. Drawing from political science and psychological theories, we examine the effects of daily confirmed cases in a country on citizens' support for the political leader through the first 120 d of 2020. Using three unique datasets which comprise daily approval ratings of head of government (n = 1,411,200) across 11 world leaders (Australia, Brazil, Canada, France, Germany, Hong Kong, India, Japan, Mexico, the United Kingdom, and the United States) and weekly approval ratings of governors across the 50 states in the United States (n = 912,048), we find a strong and significant positive association between new daily confirmed and total confirmed COVID-19 cases in the country and support for the heads of government. These analyses show that political leaders received a boost in approval in the early months of the COVID-19 pandemic. Moreover, these findings suggest that the previously documented "rally 'round the flag" effect applies beyond just intergroup conflict.

COVID-19 | leader support | political support

As of May 1, 2020, COVID-19 had already infected over 3 million and killed 250,000 people. Many political leaders and governments were criticized for their responses to the pandemic. The US government was criticized for insufficiently testing its citizens during the early stages of the crisis (1); the Japanese government was criticized for not declaring a national emergency sooner than they did, in the hope of hosting the Olympic Games as planned (2); medical doctors and nurses in Hong Kong went on strike due to government's inefficiency in handling the pandemic (3). All of these anecdotes suggest that world leaders should suffer in their political ratings during this crisis, because many, if not all, countries have failed to aggressively address this pandemic effectively. Indeed, even the best possible outcome from COVID-19 would involve distressingly high numbers of infected and dead and a severe impact on the economy, leaving political leaders vulnerable to bad publicity.

The political science literature, however, suggests another possibility. Specifically, the "rally 'round the flag" effect suggests that citizens tend to support their national leaders in times of international crises (4–6). The rally effect can be explained by enhanced feelings of patriotism, under the perception that one's group is under attack and hence unity is required to defend the group and support the incumbent (4). Identified in the 1970s, the rally effect has received empirical support in many international crises. US presidents' approval ratings increased during the Cuban missile crisis, Iran hostage crisis, Gulf War, 9/11 terrorist attack, and the death of Osama bin Laden (7–9).

Here we explore whether this rally effect generalizes beyond intergroup conflict to leaders' approval ratings during the COVID-19 pandemic. Most, if not all, events that triggered the rally effect examined by prior research were limited to contexts of interpersonal and intercountry violence, involved primarily the US president, and were anthropogenic hazards. In this paper, we integrate the political science literature with psychological theories to suggest that COVID-19, an international public health crisis, would also lead to increased political support for one's national leader. Most importantly, we hypothesize that this effect may transcend individuals' political ideologies, and generalize beyond the United States to world leaders from diverse cultural backgrounds.

Multiple psychological theories converge to support this hypothesis. System justification theory posits that people are motivated to justify and rationalize the way things are, even when the social, political, or economic systems negatively affect their self-interest (10, 11). Perceived threat and powerlessness are key triggers of system justification beliefs, leading people to support the status quo and display increased trust toward authorities such as governments, because doing so reduces uncertainty and minimizes the perceived threat (11, 12). Past research finds that liberals and conservatives show the same system justification behaviors and beliefs being exposed to threats (13).

Research on cultural evolution provides a complementary explanation for this effect. Cultural evolutionary models suggest that adherence to group norms and support for group leaders can preserve group unity and prosociality during times of threat and scarcity (14). In particular, tightness–looseness theory suggests that group cohesion and coordination are necessary for human groups to overcome existential threats, and so it is functional for human groups to rally around strong leaders in the face of these threats (15) (see *SI Appendix* for a more in-depth discussion).

The rally effect identified in these literatures provide some conceptual support for a counterintuitive hypothesis—citizens should increasingly endorse their national leaders as the COVID-19 pandemic worsens. We therefore predict that COVID-19 cases

Significance

Amid the present COVID-19 pandemic, we find that many citizens around the world "rally 'round the flag" and increase their support for their respective political leaders. We observe these findings among countries that are culturally and geographically diverse, and even among leaders who are strongly disliked by citizens prior to the pandemic. Our findings could have important voting implications during or immediately after the pandemic. As an example, the Korean ruling party won the most seats in the house by any party since 1960 in an election held during the pandemic in April 2020. COVID-19 might thus serve as a catalyst to help some incumbent governments.

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should be linked with higher levels of support for national leaders, regardless of their performance in handling the pandemic.

Because the COVID-19 pandemic is rapidly evolving, monthly political polling would not be able to capture these swift changes. Thus, we use three unique datasets that survey citizens' political approval ratings of their leaders with high temporal resolution and power. The first dataset includes daily approval ratings of the chief executive of Hong Kong, the Special Administrative Region of China (n = 98,875 daily ratings from February 3 to April 30, 2020). The second dataset includes daily approval ratings of the prime ministers and presidents across 10 countries: Australia, Brazil, Canada, France, Germany, India, Japan, Mexico, the United Kingdom, and the United States (n = 1,312,325 daily ratings from January 1 to April 30, 2020), and the third dataset includes weekly approval ratings of the 50 US governors (n = 912,048) from the week of January 1 through the week of May 11, 2020.

Our datasets offer us unique strengths. In the Hong Kong dataset, we are able to test our hypothesis in a conservative manner, because the chief executive's political ratings had been relatively low due to the city's recent political unrest and the city has confirmed a very small number of COVID-19 cases. This restriction of range provides a very conservative test for our hypotheses. However, participants in these data were recruited via online convenience sampling and may not be representative of the general population. This weakness is mitigated in the broader cross-country and cross-state datasets, which included representative samples. These datasets also gave us the opportunity to test our hypothesis across countries and states that differ dramatically in their culture, geography, and responsiveness to COVID-19.

Results

Analytic Strategy. We tested our hypotheses with a series of multilevel multiple regressions, where leader approval was regressed on new and total documented COVID-19 cases. Documented cases do not reflect the actual number of COVID-19 cases, but they are appropriate for our analysis, since the public has access to documented cases rather than true cases. The bivariate distribution of cases and leader approval appeared to be better characterized by a logarithmic relationship than a linear relationship (Fig. 1), and models containing log-transformed approval showed substantially higher fit than models with no log transformation or log-transformed COVID-19 cases (*SI Appendix*). For this reason, we log-transformed leader approval before testing our hypotheses. Our results are substantively the same whether or not we employed log transformation (*SI Appendix*).

For the Hong Kong analysis, we fit a multilevel model to account for the fact that days were nested in individuals. We also replicated our results controlling for age, gender, and political orientation (scored from 1 to 4, where higher values were more liberal). For the cross-country and cross-state analysis, we fit multilevel models to account for the fact that days were nested in nations. We also within-group centered the number of cases to avoid confounding cross-group (level-2) variation in COVID-19 cases and leader approval with within-group (level-1) variation in these variables across time. This centering strategy made our analyses exclusively focused on level-1 variation. Thus, we did not include level-2 covariates such as GDP per capita, since these variables would not affect level-1 variation. We estimated effect size by 1) estimating the number of cases that would translate to an additional boost in approval rating and 2) estimating standardized βs (COVID-19 cases were standardized within groups to avoid pooling level-1 and level-2 variance). While there is no universal measure of effect size for multilevel models, these techniques help communicate the real-world implications of our effects.

In supplemental models within *SI Appendix*, we explore potential group-level moderators of the rally effect. Our cross-country dataset did not include enough group-level power to test for moderation, but our cross-state data were suitable for moderation analyses, since they included favorability ratings from each of the 50 US states. *SI Appendix* summarizes literature on the potential moderators of the rally effect in more depth, and evidence for each of these accounts. *SI Appendix* also contains a robustness analysis showing that our results replicate while excluding days without a single COVID-19 case.

Models. Our Hong Kong regression revealed a robust effect of COVID-19 new, $b = 0.0004$, $\beta = 0.01$, $SE = 0.00004$, $t(78090) = 8.61$, $P < 0.001$, and total, $b = 0.00001$, $\beta = 0.01$, $SE = 0.000002$, $t(78510) = 7.58$, $P < 0.001$, cases on leader approval. The effects of new, $b = 0.0004$, $\beta = 0.01$, $SE = 0.00004$, $t(70300) = 10.08$, $P < 0.001$, and total, $b = 0.00002$, $\beta = 0.01$, $SE = 0.000002$, $t(70770) = 9.88$, $P < 0.001$, cases replicated controlling for age, gender, and self-reported political orientation. While these effects were small, each model suggested that days with more COVID-19 cases had higher approval for the chief executive of Hong Kong.

Our cross-country models revealed a similar dynamic. Daily new, $b = 0.00001$, $\beta = 0.09$, $SE = 0.000002$, $t(1200) = 6.31$, $P < 0.001$, and total, $b = 0.000001$, $\beta = 0.09$, $SE = 0.0000001$, $t(1200) = 6.46$, $P < 0.001$, cases were robustly associated with leader approval. Specifically, 1,995.21 daily new COVID-19 cases translated to an additional point of leader approval. To put this number into context, the United States averaged about 30,000 new cases per day in April, whereas the United Kingdom averaged about 4,000 new cases per day in April. Fig. 1 displays this relationship in general, and by country. Table 1 summarizes each country in this analysis by its change in approval from January 1 to April 30, its number of COVID-19 cases as of April 30, and the standardized relationship between COVID-19 cases and favorability, estimated via ordinary least-squares regression models. In *SI Appendix*, we explore lagged models which suggest that COVID-19 cases and leader approval are characterized by an instantaneous relationship—moving together in time—and discuss the meaning of this relationship.

Our regression model revealed a similarly robust effect of COVID-19 cases on gubernatorial approval. Daily new, $b = 0.00002$, $\beta = 0.22$, $SE = 0.000001$, $t(947) = 11.52$, $P < 0.001$, and total, $b = 0.000003$, $\beta = 0.19$, $SE = 0.0000003$, $t(947) = 9.73$, $P < 0.001$, cases were both robustly associated with governor approval. Our models suggest that 5,305.04 new COVID-19 cases would translate to an additional point of governor approval. To put this into context, California had over 40,000 new documented cases in April, whereas North Carolina, which was less severely affected in April, had ~9,000 new documented cases. Fig. 2 displays a time series of weekly COVID-19 cases (in red) against weekly approval (in blue). On average, US governors' approval increased 19.08% from January 1 until May 11.

In sum, rises in COVID-19 cases were associated with higher approval across nations and American states. Yet this effect size varied. For example, the effect of new COVID-19 cases was far stronger in Canada ($\beta = 0.90$) than in Mexico ($\beta = -0.07$), and it was stronger in Illinois ($\beta = 0.63$) than in Alaska ($\beta = 0.13$). It is plausible that this variation is related to cultural factors such as tightness–looseness, political factors such as conservatism, or the efficacy with which leaders have acted in the face of the pandemic.

However, exploratory analyses of our cross-state data did not show support for these moderators. The only significant moderator in this analysis indicated that states with a history of disasters showed a slightly smaller boost than states with fewer natural disasters in their recent history ($b = -0.33$, $P = 0.04$; *SI Appendix*). These analyses should be interpreted with caution, since we did not have the power to replicate them at the national level. Nevertheless, they do suggest that some of the theorized moderators of the rally effect may not apply during the COVID-19 pandemic, and may only apply to certain threats such as warfare.

Discussion

Our analysis of daily political approval ratings across 11 countries/regions and 50 US states supports our hypothesis that new daily COVID-19 cases are positively associated with political favorability on the same day. A limitation is that our data were correlational, which means that we cannot make causal claims. However, our models show that the association between COVID-19 cases and approval ratings holds in a sample of 11 geographically and culturally diverse countries and across the 50 US states, and even among world leaders who are widely unpopular prior to the pandemic. That said, we do note that the rally effect is stronger for some countries than others (Table 1).

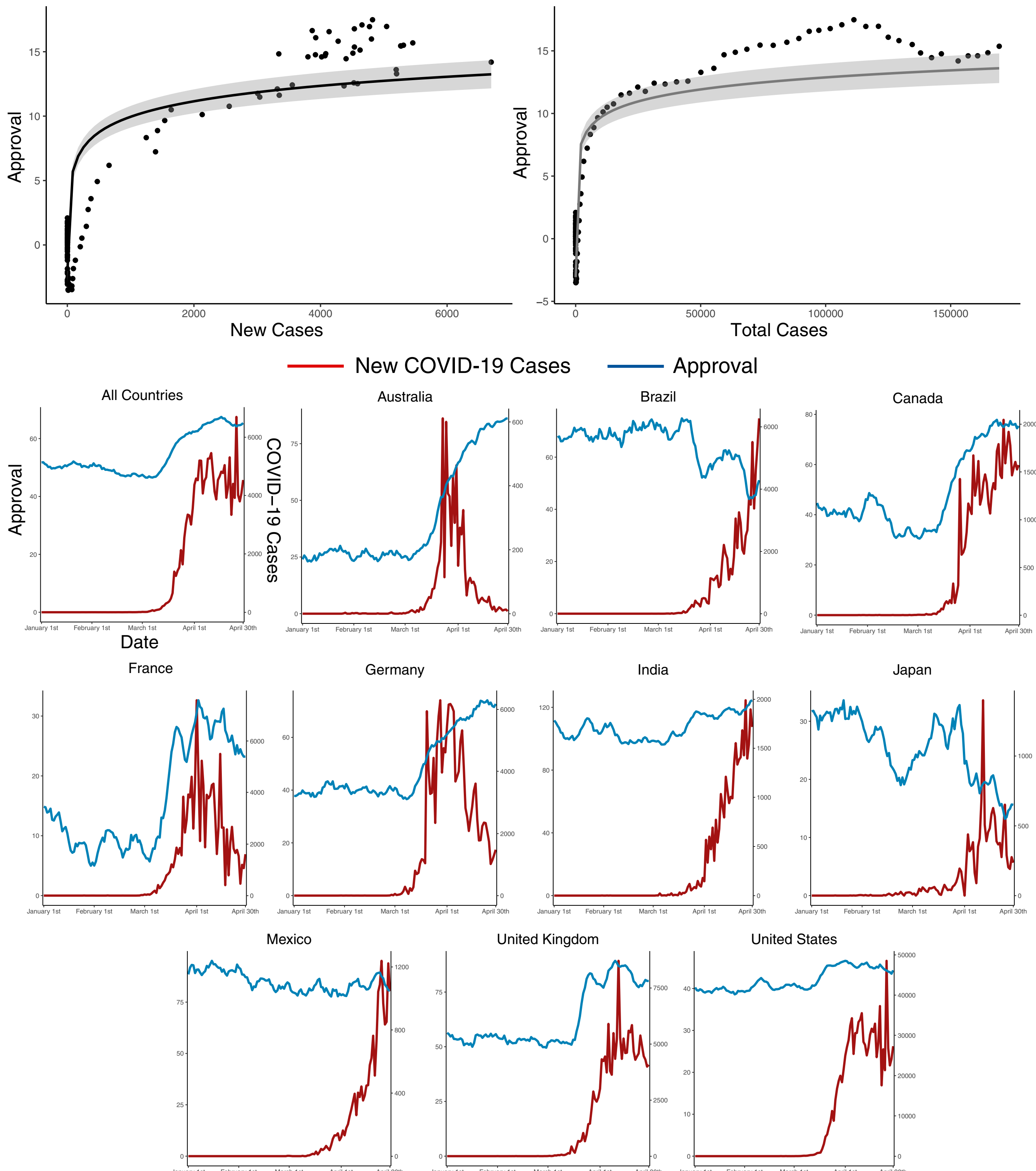

Fig. 1. (*Top*) The logarithmic relationship between daily approval ratings and (*Left*) new cases and (*Right*) total cases, averaged across nations. (*Bottom*) The trajectory of leader approval rating and total COVID-19 cases for each country.

Table 1. Approval rating and COVID-19 cases across nations

Country	Change in approval	COVID-19 cases	Effect of total cases on approval	Effect of daily new cases on approval
Overall	M = +13.63	M = 169,412	$\beta = 0.09$, $P < 0.001$	$\beta = 0.09$, $P < 0.001$
Australia	+61.19	6,746	$\beta = 0.97$, $P < 0.001$	$\beta = 0.43$, $P < 0.001$
Brazil	−16.43	78,162	$\beta = -0.81$, $P < 0.001$	$\beta = -0.80$, $P < 0.001$
Canada	+30.65	51,587	$\beta = 0.80$, $P < 0.001$	$\beta = 0.90$, $P < 0.001$
France	+8.38	128,442	$\beta = 0.74$, $P < 0.001$	$\beta = 0.78$, $P < 0.001$
Germany	+34.88	159,119	$\beta = 0.94$, $P < 0.001$	$\beta = 0.76$, $P < 0.001$
Hong Kong	+0.98	1,041	$\beta = 0.01$, $P < 0.001$	$\beta = 0.01$, $P < 0.001$
India	+12.85	33,050	$\beta = 0.67$, $P < 0.001$	$\beta = 0.73$, $P < 0.001$
Japan	−16.08	14,088	$\beta = -0.79$, $P < 0.001$	$\beta = -0.61$, $P < 0.001$
Mexico	−7.95	17,799	$\beta = -0.08$, $P = 0.40$	$\beta = -0.07$, $P = 0.43$
United Kingdom	+23.68	165,221	$\beta = 0.74$, $P < 0.001$	$\beta = 0.90$, $P < 0.001$
United States	+4.08	1,039,909	$\beta = 0.63$, $P < 0.001$	$\beta = 0.84$, $P < 0.001$

Shown are country-specific change in approval ratings, COVID-19 cases, and country-specific general linear models estimating the relationship between the two. Change in approval is calculated by the difference between approval on the first available day and the final available day, COVID-19 cases are documented cases as of April 30 data, and difference in approval ratings is calculated by the difference between the first available day and the last available day. Hong Kong data come from a different dataset than the other cultures, and Hong Kong estimates come from a multilevel model rather than a general linear model.

Another limitation of our analysis is that we cannot estimate the time course of this effect. Since we collected our data, Donald Trump's approval rating has dropped, whereas Justin Trudeau's approval rating appears to have remained high. This may be because the rally effect decays over time, or becomes more sensitive to how leaders have handled a threat, but these possibilities go beyond the scope of our data.

Our findings could have important voting implications. If citizens do "rally 'round the flag," then upcoming elections during or in the aftermath of COVID-19 could potentially be advantageous for some incumbents. This suggests that COVID-19 may have an enduring geopolitical impact long after its acute impacts have subsided.

Materials and Methods

We purchased the Hong Kong data from Hong Kong Public Opinion Research Institute (HKPOP; https://www.pori.hk/), and purchased the cross-country data from Morning Consult (https://morningconsult.com/). We confirmed that we reported all available dates and countries in which daily political approval ratings data were collected. Morning Consult also collected data from Russian and Chinese participants. However, political approval rating was not part of the survey in these two countries, and hence we are unable to include these two countries in the analyses.

Hong Kong Data. HKPOP recruited panelists in random telephone surveys, and interested participants provided their contact information and demographic information. In this particular survey, HKPOP recruited participants through daily email surveys and asked participants to provide ratings of the chief executive and other social issues. All survey questions were provided in both English and Cantonese. Because of convenience sampling, this sample skewed female, and were younger and more politically liberal than the general population in Hong Kong. HKPOP provided individual raw data for our research, which allowed us to use hierarchical linear modeling to test our hypotheses. The total number of unique individuals in this sample is 21,904.

Cross-Country and Cross-State Data. Morning Consult recruited its participants using a stratified sampling approach, by matching their participant pools with a given nation's or state's official government census data, based on age, gender, region, and education (plus ethnicity in the United States and 50 US states). For the cross-country data, ∼300 to 500 unique individuals from each country were polled daily, except in the United States, where ∼6,000 unique individuals were polled daily. For the cross-state data, ∼61 (Alaska) to 3,500 (Florida) unique individuals from each state were polled weekly. Attention check items were employed to screen out inattentive respondents. All survey questions were provided in languages appropriate for the participants' countries, translated and localized by professional translation firms. We note that the state approval rating data also contained approval of two governors who left office in early 2020 (Matt Bevin of Kentucky and Phil Bryant of Mississippi) and were replaced. We removed ratings of these ex-governors to avoid confounding change over time in approval with change in governor.

The cross-country dataset indexed approval through a single number from −50 to 50, and we transformed this to a 0 to 100 scale by adding 50. The cross-state dataset indexed approval through two separate "approval" and "disapproval" indicators, each from 0 to 100. We created a single approval variable by subtracting disapproval from approval, and then adding 50. This transformation eliminated any negative values, enabling log transformation, but it also meant that favorability values exceeded 100 for the most popular governors (e.g., Larry Hogan of Maryland).

Because these data are proprietary, we do not have access to individual raw data. Instead, Morning Consult provided us the daily aggregated data for each country and state, which were used for data analyses.

Data on COVID-19 Cases and Tests. We obtained data on national daily rates of total and new confirmed COVID-19 cases from Johns Hopkins (https://coronavirus.jhu.edu/). We obtained statewide data on COVID-19 cases and testing from the COVID tracking project (https://covidtracking.com/), which provided daily estimates of cases and tests for each state, which we aggregated to the week level to match the governor approval data. Prior to analysis, we identified 13 data points in the COVID tracking data with negative testing values. According to the COVID tracking project, these artificial negative values arose from an

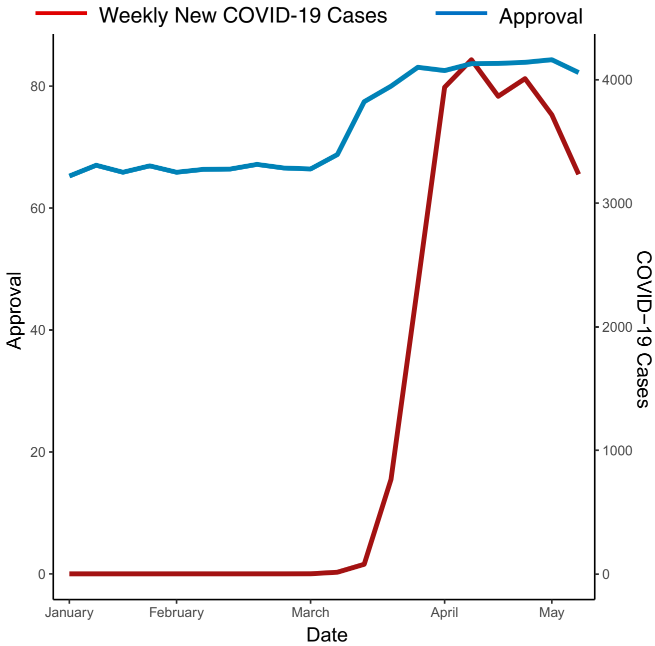

Fig. 2. A comparison of weekly gubernatorial approval (in blue) against weekly new confirmed COVID-19 cases (in red).

administrative error related to out-of-state testing (https://covidtracking.com/data/). We removed these data points prior to analysis.

Data Availability. Data and code have been deposited in the Open Science Framework database (https://osf.io/utqz5/?view_only=c4559d4b72da4d5fa0baeee4c307af24).

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