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Short Communication

Associations of presidential voting preference and gubernatorial control with county-level COVID-19 case and death rates in the continental United States



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ABSTRACT

Objective: To investigate the associations of state gubernatorial party control and 2016 county-level presidential election preference on COVID-19 case and death rates in the United States.

Study design: This was a secondary analysis of publicly available data.

Methods: Data including county-level COVID-19 case and death counts through February 9, 2021, 2020 gubernatorial data, and county-level US Census Bureau data, Broadstreet area deprivation index, and 2016 presidential voting tallies were included. Negative binomial regression estimated the adjusted impact of each variable on COVID-19 case and death rates.

Results: A total of 3102 counties in the 48 continental United States plus Washington DC were included. County-level case and death rates were higher (12% and 22%, respectively) in Republican vs Democrat controlled states. Case and death rates were higher in counties voting Republican vs Democrat in 2016 and were modified by counties with median ages ≥ 50 years (54% increase in case rate and 91% increase in death rate).

Conclusions: These data further support the need for prevention efforts to focus on public health while extricating guidance and prevention from political agendas.

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Coronavirus disease 2019 (COVID-19) has caused over 171 million infections and over 3.5 million deaths worldwide as of June 1, 2021,¹ ensuring prevention interventions are a mainstay of daily life. These interventions form the response to any infectious disease and will continue to be consequential in guiding us to the end of the pandemic.²

Public health response is an apolitical activity at its essence. However, political agendas continue to play a major role in nearly every aspect of this pandemic, from case identification through vaccine development and provision. Although much was speculated

as to the impact of COVID-19 on the 2020 election cycle in the United States,³ there is a paucity of evidence as to the impact of federal or state political party control or voting preferences on COVID-19 incidence and outcomes.⁴

The objectives of this study were to investigate associations of state gubernatorial parties and 2016 county-level presidential election preference on COVID-19 case and death rates in the United States.

This was a secondary analysis of publicly available data collected through several sources: (1) Google BigQuery public access datasets (New York Times COVID-19 case/death reports and estimated mask use⁵ through February 9, 2021, Broadstreet county-level area deprivation index,⁶ and US Census Bureau American Community Survey 2018 5-year county-level demographics and 2019 single-year county-level population estimates⁷), (2) MIT Election Data and Science Lab (via Harvard Dataverse) 2016 presidential election

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votes by county,⁸ and (3) web-scraping of the list of current state governor political party as of February 1, 2020.⁹

Presidential voting preference in 2016 was computed and categorized as ‘Republican’ if the majority of the county voted for Donald Trump vs ‘Democrat’ if the majority of the county voted for Hillary Clinton in November 2016. The gubernatorial party of the state was categorized as Republican or Democrat based on the party affiliation of the governor as of February 1, 2020. County-level demographic data expressed in percentages (population living in group quarters, Black race as defined by the US Census Bureau, Hispanic ethnicity, and male gender) were divided by 10 prior to modeling. The area deprivation index was categorized into counties within the top 25th percentile. Estimated mask use was categorized into ‘always’ if the plurality of the county indicated such.

Crude case and death rates by the 2016 presidential voting preference and median county age (≥ 50 vs < 50 years) per 100,000 population were computed by dividing the total case or death count by the 2019 American Community Survey single-year population estimates.

Negative binomial regression was used to estimate the impact of each variable on the case and death counts, offset by the US population per the 2019 American Community Survey single year estimate. Multiplicative interaction terms were explored between 2020 gubernatorial party and 2016 presidential voting with all other census level variables included in the model; only (county age)*(2016 voting preference) was significant.

R v4.0.4 (R Foundation for Statistical Computing, Vienna Austria) was used for all analyses. Rate Ratios and 95% confidence intervals were calculated, and estimates, where the 95% confidence interval excluded the null value, were considered statistically significant.

A total of 3102 counties in the 48 continental United States plus Washington DC were included in the analysis. Crude case and mortality rates by 2016 presidential voting preference and median county age was as follows:

- 1) median age < 50 , Republican = 8598 cases and 139 deaths/100,000 population;
- 2) median age < 50 , Democrat = 8037 cases and 135 deaths/100,000 population;
- 3) median age ≥ 50 , Republican = 6280 cases and 146 deaths/100,000 population;

- 4) median age ≥ 50 , Democrat = 3610 cases and 102 deaths/100,000 population.

Crude case and mortality rates for 2020 gubernatorial party were:

- 1) Republican = 8805 cases and 141 deaths/100,000 population;
- 2) Democrat = 7785 cases and 133 deaths/100,000 population.

Results of the multivariable negative binomial regression models can be found in Fig. 1, with all variables being statistically significant. In the case-rate model, states with Republican vs Democrat governors had a 12% (95% confidence interval [CI]: 1.09–1.14) higher case rate. Counties with a median age of ≥ 50 had a 43% (95% CI: 1.19–1.72) stronger relationship of 2016 election party affiliation and case rate vs those < 50 . In counties with median age < 50 , 2016 Republican vs Democrat voting preference counties had a 7% (95% CI: 1.303–1.11) higher case rate while in counties with median age ≥ 50 , there was a 54% (95% CI: 1.28–1.84) higher case rate. The death-rate model showed similar results. There was a 22% (95% CI: 1.17–1.27) higher death rate in Republican vs Democrat party-controlled states. Counties with Republican vs Democrat preference in 2016 were associated with 20% (95% CI: 1.12–1.28) and 91% (95% CI: 1.34–2.73) increases in death rate within counties of median age < 50 and ≥ 50 , respectively. This represents a 59% (95% CI: 1.11–1.28) stronger relationship of 2016 election party affiliation and death rate in counties with a median age of ≥ 50 . High deprivation and a higher proportion of Black, male, and Hispanic population were associated with higher case and death rates, while mask use was associated with lower rates.

Here, we report evidence generating a hypothesis that political bias in US county-level and state COVID-19 responses may exist, which may have led to higher county-level case and death rates. Further, the median age of counties played a similarly important role in the 2016 presidential voting preference.

The political impacts may unfold at three relevant levels. First, individuals in counties with a strong partisan lean may share views opposed to, or in support of, public health interventions. Second, partisan lean may serve as a proxy for the willingness of local government to take on and enforce public health guidelines. Third,

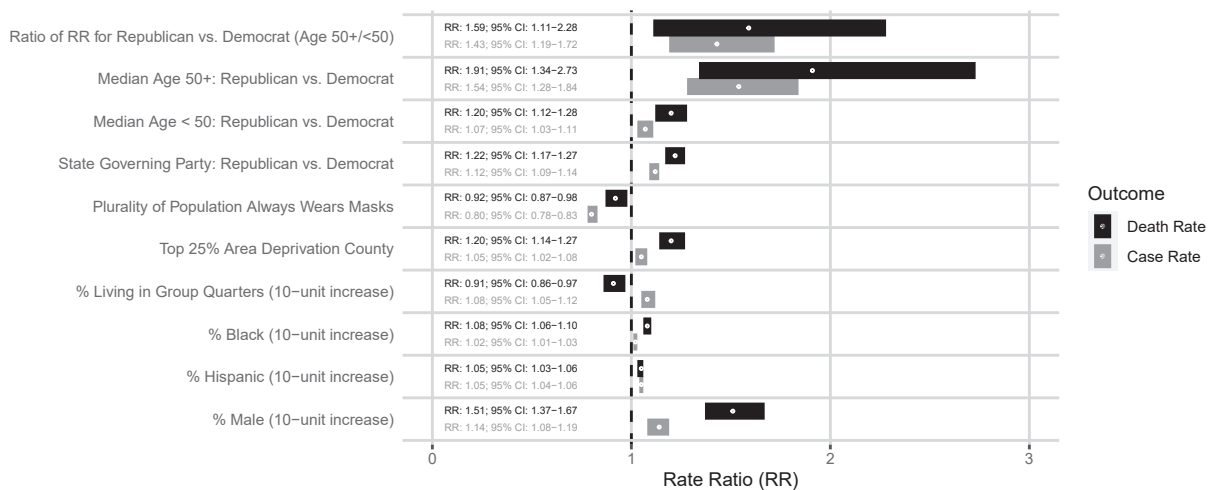


Fig. 1. Adjusted rate ratios and 95% Confidence Intervals for COVID-19 case and death rates.

the partisan make-up of state government may inform policy responses to COVID-19. It is important to note that these patterns are not inevitable. Rather, the political undertones of our pandemic response reflect broader social divisions and the segregated nature of both public life and media consumption. These may set the stage for greater partisan reaction, conditioning both individuals and institutions to be more likely to respond in particular ways. Moreover, they are not deterministic. On an individual basis, many Republican governors and local leaders did implement broad-reaching, science-based public health interventions, and conservative individuals followed them.

Finally, these patterns may or may not be durable. Crosby¹⁰ refers to the 1918 Influenza Pandemic as ‘America’s Forgotten Pandemic.’ What feels like deep, intractable partisan differences now may wane or shift with time. The lesson is not about the specifics of which political groups responded in particular ways but rather that our collective response was partisan despite the nominally apolitical nature of public health.

This study has several limitations. First, it is ecological in nature, preventing causal associations from being determined. Second, data on county-level COVID-19 prevention policies were not available, which may modify or interact differently with state or federal guidance. Critical variables such as mask use are only estimates and may bias results. Further, shifts in response over the course of the pandemic have resulted in varied case and death rates by demographics. We were also not able to compute estimates from 2020 county-level voting preferences due to data unavailability, nor were we able to compute estimates based on congressional district. Both might provide additional insight into possible political biases in pandemic response.

In conclusion, there is a multitude of factors that drive infection rates for any disease. Given the partisan approach to the COVID-19 response to date in the United States, these data further support the need for prevention efforts to focus on public health while extricating guidance and prevention from political agendas.

Author statements

Ethical approval

Since this study includes only publicly available, aggregate, de-identified data, it did not warrant human subjects protection review.

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Competing interests

None of the authors have any competing interests to declare.

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