



Politics in Public Health: Growing Partisan Divides in COVID-19 Vaccine Attitudes and Uptake Post-2021 Presidential Inauguration

Hongbin Fan¹, Zhongliang Zhou^{1*}, Guanping Liu¹, Chi Shen^{1*} and Qi Zhang²

¹School of Public Policy and Administration, Xi'an Jiaotong University, Xi'an, Shaanxi, China, ²School of Community and Environmental Health, Old Dominion University, Norfolk, VA, United States

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*Correspondence

Zhongliang Zhou,
✉ zzliang1981@xjtu.edu.cn
Chi Shen,
✉ chi.shen@xjtu.edu.cn

[†]Present address:

Chi Shen,
School of Medicine and Health
Management, Tongji Medical College,
Huazhong University of Science and
Technology, Wuhan, China

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Objectives: To investigate whether the 2021 U.S. presidential inauguration contributed to a widening of partisan divides in COVID-19 vaccine attitudes and uptake.

Methods: We leverage the presidential inauguration as a natural experiment and analyze data from the Household Pulse Survey and CDC vaccination records. Using a difference-in-differences framework with continuous treatment, we examine how the transition differentially affected state-level vaccine refusal rates and county-level vaccination rates, based on varying levels of partisanship as measured by the Trump–Biden vote gap.

Results: Following Biden's inauguration, vaccine refusal declined more in pro-Biden states. Distrust in government and vaccines accounted for approximately 80% of the interstate variation. County-level analysis revealed that for every 1 percentage point increase in Trump's vote share over Biden's, counties experienced an additional 0.515%–2.674% decline in vaccination rates among adults aged 65+. These effects were more pronounced in politically loyal and high-turnout counties.

Conclusion: The presidential transition appears to have widened partisan divides regrading COVID-19 vaccines. These findings highlight the need for depoliticized health messaging and bipartisan strategies to mitigate the influence of partisanship on public health.

Keywords: political polarization, partisan divides, COVID-19 vaccine attitudes, COVID-19 vaccine uptake, presidential transition

INTRODUCTION

Political polarization has been on the rise in the United States. Partisans become increasingly isolated from one another in both lives and ideological thinking. Partisanship is also substantially related to behavior [1, 2]. Nowadays, partisan identity is nearly three times more predictive on a range of social policy issues than other demographic factors [3]. For many Americans, politics has become an extended feature of their social identities, influencing and shaping their behavior in areas seemingly unrelated to politics [4].

With COVID-19 vaccines available to the public by December 2020, vaccination uptake became a public health priority essential to controlling the pandemic. However, the COVID-19 issue in the U.S. was more than just a public health issue [5, 6]. Partisan elites politicized the COVID-19-related issues

from the very onset of the pandemic in early 2020 [7], and almost all COVID-19 related attitudes, beliefs, and behaviors have been sharply polarized along party lines [8]. With partisan media often amplifying elite divisions [9], more voters adopted their party's position on controversial issues [10], and actions like mask-wearing or vaccination became political statements in many communities [11].

While many studies have documented partisan divides in COVID-19 vaccine attitudes [12–16] and uptake [11, 17], the dynamics underlying the formation and intensification of these divides remain underexplored. President Biden's inauguration presents a unique context to examine how a shift from a Republican to a Democratic administration might catalyze a rapid polarization in vaccine perceptions. This study leverages this political transition as a natural experiment to investigate how elite-driven politicization, amplified by such a high-profile event, can reinforce partisan attitudes toward public health measures in the short term. By focusing on this pivotal period, we aim to provide insights into how executive power transitions impact vaccine attitudes and uptake polarization, contributing to a deeper understanding of how political events shape health-related partisanship.

This study examines partisan shifts in COVID-19 vaccine attitudes and uptake surrounding Biden's inauguration. We investigate state-level changes in vaccine refusal rates before and after the inauguration in relation to partisan support, and we explore how distrust in government and vaccines may relate to these changes. Additionally, using county-level vaccination data for individuals aged 65 and above, we employ a causal inference analysis to assess the heterogeneous effects of the presidential transition on vaccine uptake in counties with different levels of partisanship.

This research contributes to a deeper understanding of how changes in executive leadership may intensify partisan divides in public health responses, offering insights into the challenges of managing health crises in politically polarized societies.

METHODS

Data Sources

There are two main data sources in our study. The first main data source is the Household Pulse Survey (HPS), a state-representative survey of individuals. However, it does not include questions about political leanings, so we selected only state-level estimates about COVID-19 vaccine attitudes. New questions regarding COVID-19 vaccine attitude was introduced to the questionnaire beginning with “week” 22 (6–18 January) of the HPS data collection period (biweekly). We thus use data based on the estimates from the 6–18 January and 3–15 February 2021, survey waves to describe a general result about COVID-19 vaccine attitudes.

The second main data source is the CDC data [18], in which we gathered county-level COVID-19 vaccination records and state-level COVID-19 vaccine distribution records from 25 December 2020, to 20 February 2021. Since COVID-19 vaccines were primarily given to healthcare workers and the elderly during this period, and healthcare workers were less

representative than the elderly due to their professional knowledge of COVID-19 vaccines, the population aged 65 and older became our study population. With the exception of records from unknown counties, a total of 225,680 vaccination records were initially obtained. We then excluded records with missing values in county-level vote results in the 2020 presidential election and key covariates (e.g., new COVID-19 cases, median household income), as well as a county's records for that day and the following day if the value for the number of people who received a COVID-19 vaccine in the county on that day was zero or missing. Finally, a total of 68,696 vaccination records from 2,711 counties were included in final analysis.

Based on 5-year estimates from the 2019 American Community Survey by the Census Bureau, we gathered data on county characteristics, including demographic, social, and economic aspects. We gathered county-level social capital characteristics from The Geography of Social Capital (U.S. Congress, 2018). Additionally, we gathered COVID-19 infection and death data from the COVID-19 Impact Analysis Platform at the University of Maryland [19].

Indicators

We constructed measures of the COVID-19 vaccine refusal rate (CVRR), CVRR due to distrust of the government, and CVRR due to distrust of COVID-19 vaccines using HPS survey data. CVRR was the proportion of people who were “not receiving” or “not planning” to receive a COVID-19 vaccine. CVRR due to distrust of the government and CVRR due to distrust of vaccines were the percentages of residents who would “probably not” or “definitely not” receive a vaccine due to “distrust of the government” and “distrust of COVID-19 vaccines,” respectively.

Using CDC data, we calculated the daily COVID-19 vaccination rate for people aged 65 and above, defined as the daily increase in the percentage of this population receiving at least one vaccine dose.

A continuous index of partisanship was created using the county-level/state-level voting gap in the 2020 election—that is, the proportion of total votes for Donald Trump minus the proportion of total votes for Joe Biden.

Time-varying control variables include new COVID-19 cases per 1,000, active COVID-19 cases per 1,000, COVID-19 death rate and COVID-19 vaccine supply per 100 k (distributed doses minus administrated doses). Time-invariant control variables include demographic characteristics, such as age and race; social characteristics, such as marital status and education attainment; economic characteristics, such as median household income and unemployment rate; and pandemic characteristics, such as 2020 accumulated COVID-19 cases and death cases; and social capital characteristics, such as non-religious non-profit organizations per 1,000 and mail-back census response rates. The descriptive statistics of dependent and main independent variables are described in **Table 1**, while the descriptive statistics of additional control variables are described in **Supplementary Table S1**.

Empirical Strategy

To demonstrate the growing partisan divide in COVID-19 vaccine attitudes in the month after Biden's inauguration, we

TABLE 1 | Descriptive statistics of dependent and main independent variables (Politics in Public Health, United States, 2020-2021).

| Indicators | N | Mean | SD | Median | Min | Max | Level |
|--|--------|------------|------------|-----------|---------|-----------|-------------|
| COVID-19 Vaccine Refusal Rate | 100 | 31.41 | 5.43 | 31.26 | 18.86 | 44.22 | State |
| COVID-19 Vaccine Refusal Rate due to distrust of the government | 100 | 6.26 | 1.80 | 6.31 | 2.43 | 10.63 | State |
| COVID-19 Vaccine Refusal Rate due to distrust of COVID-19 vaccines | 100 | 6.63 | 1.99 | 6.39 | 2.10 | 11.75 | State |
| 2020 Trump-Biden Vote Gap | 50 | 0.0232 | 0.2079 | 0.0055 | -0.3560 | 0.4366 | State |
| Daily COVID-19 Vaccination Rate | 68,696 | 0.01 | 0.01 | 0.01 | 0.00 | 0.51 | County, Day |
| COVID-19 Vaccine Supply per 100 k | 68,696 | 5,253.89 | 1,397.41 | 5,401.00 | 0.00 | 15,268.00 | County, Day |
| New COVID-19 Cases per 1,000 | 68,696 | 0.25 | 0.26 | 0.19 | 0.00 | 23.58 | County, Day |
| Active COVID-19 Cases per 1,000 | 68,696 | 14.31 | 5.66 | 14.22 | 0.00 | 32.68 | County, Day |
| COVID-19 Death Rate | 68,696 | 7.56 | 2.52 | 7.06 | 1.74 | 16.58 | County, Day |
| 2020 Trump-Biden Vote Gap | 2,711 | 0.3009 | 0.3129 | 0.3637 | -0.8675 | 0.8893 | County |
| Population | 2,711 | 108,065.10 | 333,496.80 | 28,608 | 668 | 10100000 | County |
| Proportion Age 65+ | 2,711 | 18.80 | 4.42 | 18.50 | 3.20 | 56.70 | County |
| Proportion Hispanic or Latinx | 2,711 | 6.83 | 9.30 | 3.70 | 0.00 | 84.20 | County |
| Proportion Black or Africa | 2,711 | 9.41 | 14.94 | 2.20 | 0.00 | 87.20 | County |
| Proportion Asia | 2,711 | 1.34 | 2.55 | 0.60 | 0.00 | 39.60 | County |
| Median Household Income | 2,711 | 53,457.38 | 14,033.10 | 51,734.00 | 21,504 | 142,299 | County |
| Population Density | 2,711 | 233.98 | 1,344.48 | 47.00 | 0.00 | 48,341.00 | County |
| Urbanization Rate | 2,711 | 0.42 | 0.31 | 0.41 | 0.00 | 1.00 | County |

use state-level representative data from HPS to give general results.

To get evidence of growing partisan divide in COVID-19 vaccination, our estimation strategy is logically equivalent to a standard differences-in-differences (DID) strategy. We compared the relative change in daily COVID-19 vaccination rates in the post-Biden period (in the month after Biden's inauguration) relative to the pre-Biden period between pro-Trump counties and pro-Biden counties. Our estimates differ from a standard DID strategy because we capture more variation in the data by using a continuous measure of the intensity of treatment (the vote gap in the 2020 election). The strategy referring to Qian [20], the regression model is constructed by the DID with continuous treatment in this study as shown in **Equation 1**:

$$\log(DCVR_{it}) = \beta_0 + \beta_1 \cdot VG_i \cdot I_t^{post} + X_{it} \cdot \tau + \sum_{j=-26}^{31} X_i \cdot I_t^j \cdot \Phi_j + \sum_c \delta_c \cdot I_i^c + \sum_{j=-26}^{31} \gamma_t \cdot I_t^j + \varepsilon_{it} \quad (1)$$

Where:

- $\log(DCVR_{it})$ denotes the logarithmic form of daily COVID-19 vaccination rate for each county i admitted at day t . We take the natural log of the variables to remove the skewness that exists in their distributions otherwise.
- VG_i denotes the vote gap in the 2020 election for each county i .
- I_t^{post} is a dummy variable equaling 1 for the periods after 20 January 2021, otherwise is 0.
- $\sum_{j=-26}^{31} \gamma_t \cdot I_t^j$ and $\sum_c \delta_c \cdot I_i^c$ are time and county fixed effects.
- X_{it} are a series of time-varying control variables including vaccine supply, daily new COVID cases, COVID death rate, active COVID cases.

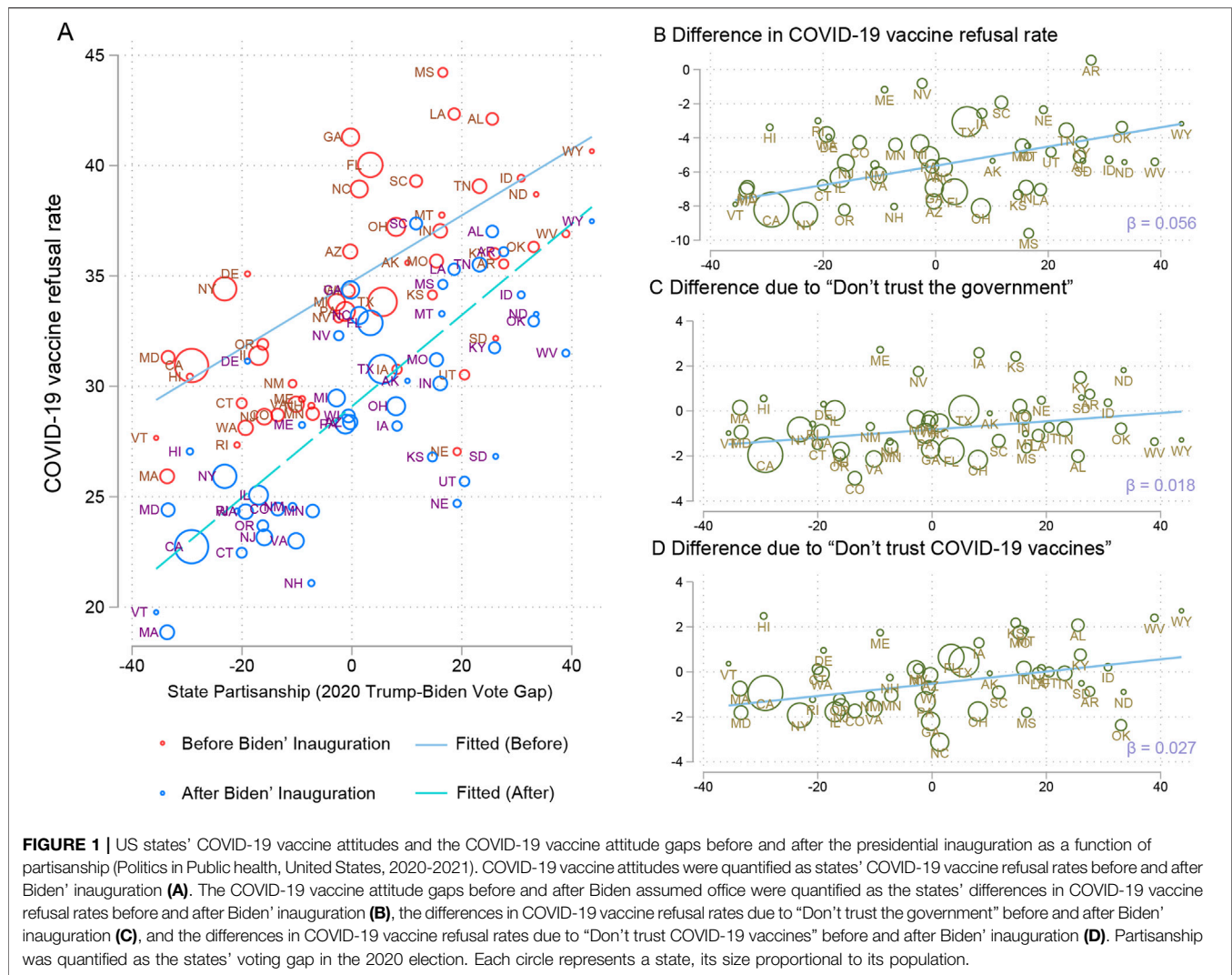
- $\sum_{j=-26}^{31} X_i \cdot I_t^j \cdot \Phi_j$ are county-specific characteristics (time-invariant control variables) interacted with time-period fixed effects
- Estimation is generally performed with standard errors clustered at the county level and weighted by population.

The coefficient of interest in **Equation 1** is β_1 , which measures the additional growth in daily COVID-19 vaccination rate experienced by counties that voted more for Trump (relative to those that voted more for Biden) in the month after Biden's inauguration (relative to before). A negative coefficient indicates that counties that voted more for Trump witnessed an additional less COVID-19 vaccination in the month after Biden's inauguration, relative to before.

Equation 1 examines the average effect of partisanship on vaccination in the month after Biden's inauguration. Referring to Nunn [21], our strategy for providing a precise estimate of the dynamic treatment effect and testing the hypothesis of parallel trend is to estimate a fully flexible estimating equation that takes the following form:

$$\log(DCVR_{it}) = \beta_0 + \sum_{j=-26}^{31} \beta_j \cdot VG_i \cdot I_t^j + X_{it} \cdot \tau + \sum_{j=-26}^{31} X_i \cdot I_t^j \cdot \Phi_j + \sum_c \delta_c \cdot I_i^c + \sum_{j=-26}^{31} \gamma_t \cdot I_t^j + \varepsilon_{it} \quad (2)$$

where all variables are defined as in **Equation 1**. The only difference from **Equation 1** is that in **Equation 2**, rather than interacting VG_i with a post-Biden indicator variable, we interact vote gap measure with each of the time-period fixed effects. The estimated vectors of β_j s reveal the correlation between vote gap and the outcomes of interest for each time period. If partisan



difference in daily COVID-19 vaccination rate was aggravated in the month after Biden's inauguration, then we would expect the estimated $\beta_{i,s}$ to be constant over time for the days before Biden's inauguration and to be larger in magnitude for the days after the inauguration.

RESULTS

Growing Partisan Divide in COVID-19 Vaccine Attitudes

Using data from the HPS survey, **Figure 1A** shows that both before and after Biden took office, COVID-19 vaccine refusal rates were consistently higher in states that voted more for Trump in the 2020 election compared to states that voted more for Biden. However, in the month after Biden's inauguration, the correlation between COVID-19 vaccine refusal rates and vote gaps grew stronger (the coefficient increased from 0.15 to 0.21).

To better demonstrate the heterogeneous effects of Biden's taking office on COVID-19 vaccine attitudes in states with different levels of partisanship, we compared the differences in COVID-19 vaccine refusal rates before and after Biden took office between states. The results in **Figure 1B** show that COVID-19 vaccine refusal rates declined in almost every state in the month after Biden's inauguration, but the magnitude of the decline varied greatly: states that voted more for Trump showed obviously fewer declines (e.g., California showed an over eight absolute percentage points decline, while Texas about three). Specifically, for every 1 percentage point increase in vote share for Donald Trump over Joe Biden, the drop in COVID-19 vaccine refusal rates would be reduced by 0.056 absolute percentage points on average (about 370 k people).

In addition, we compared the differences in COVID-19 vaccine refusal rates due to "Don't trust the government" and "Don't trust COVID-19 vaccines" before and after Biden's inauguration between states. The result in **Figures 1C,D** shows that, similar to the results above, states that voted more

TABLE 2 | The impact of presidential change and Biden's actions: Baseline estimates (Politics in Public Health, United States, 2020–2021).

| Ln daily COVID-19 vaccination rate | | | | |
|---|-----------------------|----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) |
| Voting gap × Post | −0.572*** (0.1668) | −0.879*** (0.168) | −0.879*** (0.2648) | −0.871*** (0.2796) |
| Controls | | | | |
| Supply | No | Yes | Yes | Yes |
| New cases | No | Yes | Yes | Yes |
| Active cases | No | Yes | Yes | Yes |
| Death rate | No | Yes | Yes | Yes |
| Baseline controls (× day fixed effects) | | | | |
| Ln (population) | No | Yes | Yes | Yes |
| Age | No | Yes | Yes | Yes |
| Race | No | Yes | Yes | Yes |
| Income | No | Yes | Yes | Yes |
| Population density | No | Yes | Yes | Yes |
| Urbanization rate | No | Yes | Yes | Yes |
| Additional controls (× day fixed effects) | | | | |
| | No | No | No | Yes |
| Fixed effect | Yes | Yes | Yes | Yes |
| cluster | County | County | State | County |
| Observations | 2,672 | 2,601 | 2,601 | 2,601 |
| N | 68,657 | 61,228 | 61,228 | 60,050 |
| R-squared | 0.394 | 0.464 | 0.464 | 0.567 |
| Adjusted R-squared | 0.369 | 0.435 | 0.435 | 0.528 |

for Trump had lower drops in vaccine refusals for both reasons in the month after Biden's inauguration. Specifically, the drop in vaccine refusal rates due to "Don't trust the government" and "Don't trust COVID-19 vaccines" would be lowered by 0.018 absolute and 0.027 absolute percentage points on average for every 1 percentage point increase in vote share for Donald Trump over Joe Biden, respectively.

Growing Partisan Divide in COVID-19 Vaccine Uptake

The average impact of Biden's taking office on partisan differences in daily COVID-19 vaccination rates among older adults (65+) can be inferred from the DID results in **Table 2**. The first specification, reported in column [1], consists of time-period fixed effects, county and state fixed effects, clusters in counties, and no controls. In column [2], we report estimates for our baseline specification, including main control variables, which are made up of time-varying control variables and time-invariant demographic and socioeconomic control variables (interacted with the time-period fixed effects). The coefficient is −0.879, which implies that in the month after Biden's inauguration, for every 1 percentage point increase in vote share for Donald Trump over Joe Biden, counties exhibited an additional 0.879 percent less COVID-19 vaccination among older adults (65+). Column [3, 4] report the robustness of our results to clustering in state and the introduction of additional control variables. We further analyze the data by splitting it into two datasets based on governor partisanship and analyzing each of them separately in order to rule out bias resulting from variations in vaccine availability. Detailed results can be found in the **Supplementary Material**.

From flexible estimates, a clear pattern emerges from **Figure 2A**. The relationship between vote gap and daily COVID-19 vaccination rates among older adults was stable before Biden's inauguration. The magnitude of the estimate then sharply increased on January 23 (COVID Data Tracker's vaccination data typically has a lag time [22]), keeping it dynamically stable at another level. Specifically, in the month after Biden's inauguration, for every 1 percentage point increase in vote share for Donald Trump over Joe Biden, counties exhibited an additional 0.515%–2.674% less COVID-19 vaccination among older adults. We learn two important facts from the fully flexible estimates. First, we do not observe any clear trends in the estimated interaction effects during the time periods immediately prior to Biden's inauguration. The second insight we gain is that the gap between counties that voted more for Trump and those that voted more for Biden in daily COVID-19 vaccination rates among older adults widened immediately after Biden took office.

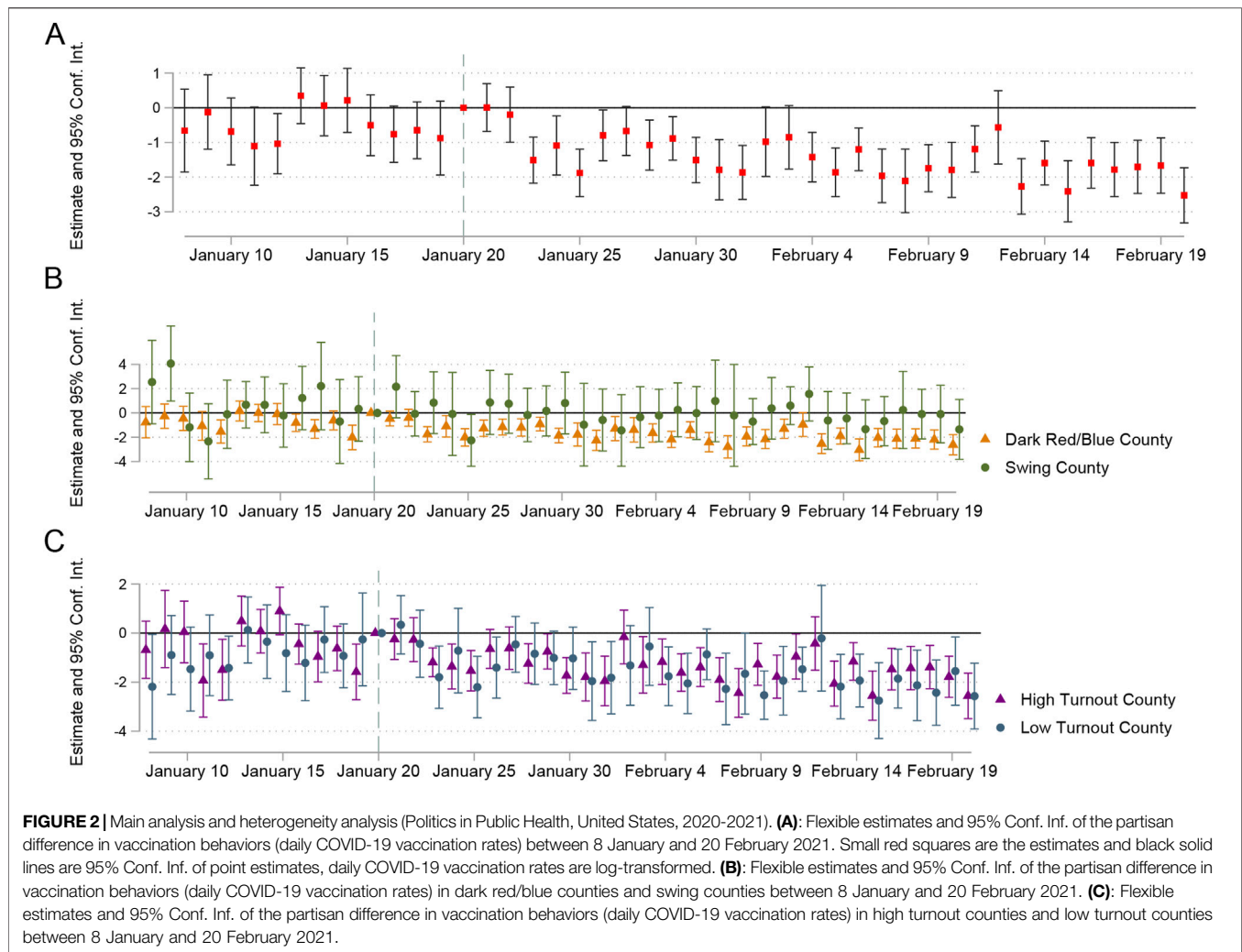
Furthermore, we conducted additional analysis to address two other questions that interested us: whether counties with higher political loyalty and whether counties with higher political participation were more adversely affected, and therefore showed more exacerbated partisan differences in COVID-19 vaccine uptake in the month after Biden's inauguration.

We call those counties that have consistently voted for one party since 2000 dark red/blue counties, and the others swing counties. **Figure 2B** shows that the exacerbated difference in daily COVID-19 vaccination rates between dark red and dark blue counties was noticeably greater than between swing counties, and the latter was almost statistically insignificant. Similarly, we refer to the counties with a turnout rate of over 50% as "high turnout counties" and the remainder as "low turnout counties." Results in **Figure 2C** demonstrate that the partisan differences in daily COVID-19 vaccination rates were also exacerbated more severely in high turnout counties.

DISCUSSION

This study suggests that partisan divides in COVID-19 vaccine attitudes and uptake may have grown wider in the month following Biden's inauguration. Specifically, a greater proportion of individuals in pro-Biden states, compared to pro-Trump states, shifted from vaccine refusal to acceptance, with around 80% of inter-state variation explained by distrust of government and COVID-19 vaccines, both likely catalyzed by Biden's presidency and his administration's policy actions. Moreover, as the partisan divide in vaccine attitudes appeared to intensify, the divide in vaccine uptake may have widened as well. Our analysis revealed that for every percentage point increase in Trump's vote share over Biden's, counties saw an additional 0.515%–2.674% reduction in COVID-19 vaccination among older adults, with the impact most pronounced in counties characterized by high political loyalty.

The potential exacerbation of partisan differences may stem from several theoretical pathways, as illustrated in **Figure 3**. First, under elite cues theory, Biden's initial executive actions—such as the "100 Days Masking Challenge" and initiatives to increase vaccination supply—could have effectively promoted vaccination among Democrats while having limited influence on



Republicans, potentially even backfiring and intensifying the partisan divide [16]. Counties with higher levels of political loyalty might have been more affected due to greater sensitivity to elite cues [23].

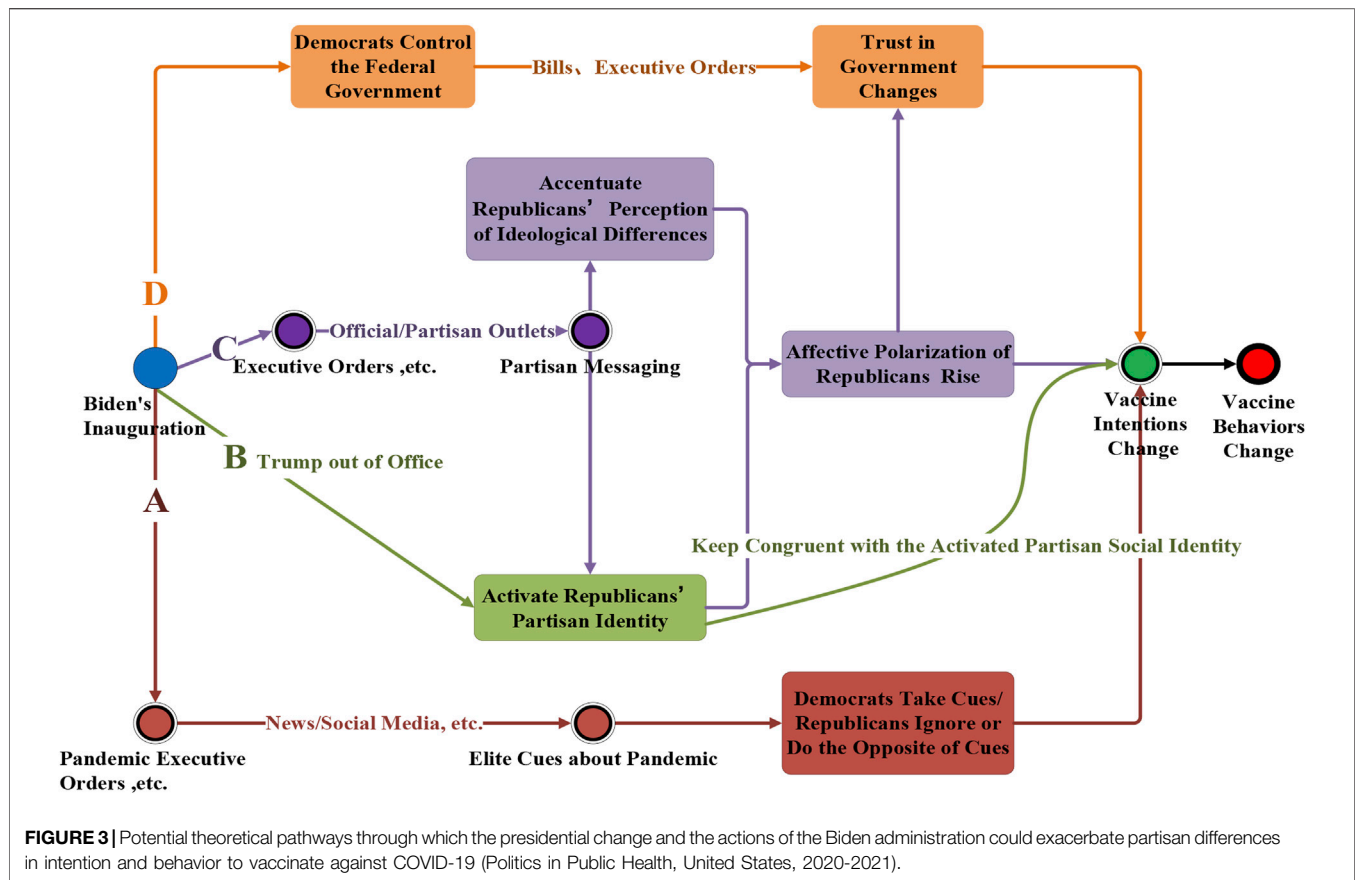
Social identity theory offers another possible explanation. Partisan social identities are often heightened during times of political transition [24]. Biden's inauguration might have reinforced Republicans' partisan identity, potentially leading them to resist vaccination efforts associated with Democratic initiatives [25]. Conversely, Democrats may have interpreted the political shift as an alignment with their values, reinforcing support for vaccination.

Affective polarization, or the intensifying animosity between partisan groups, could also have played a significant role. Political events such as elections and inaugurations tend to amplify affective polarization by increasing political conflict and media discourse [3, 26]. **Figure 4** shows the dramatic increase in the relative number of Google searches on these people and issues. As Biden assumed office, heightened hostility toward Democrats among Republicans may have further motivated vaccine

hesitancy among Republicans, deepening the partisan divide in public health compliance [27].

Finally, partisan identification may have affected vaccine willingness through varying levels of trust in government [16, 28]. As Biden took office, Democrats' trust in government could have increased, while Republicans' trust declined, leading to a broader partisan gap in vaccine uptake.

There could be other reasons for the potential exacerbated partisan differences. However, we argue that the impact of these reasons may be weaker. First, some individuals had already received COVID-19 vaccinations prior to Biden's inauguration. Compared to Republicans, vaccinated Democrats were more likely to encourage others to get vaccinated [16], while Republicans were more likely to perceive and report adverse events associated with the vaccine [6]. These differences may have contributed to a greater decline in vaccine refusal rates in pro-Biden states. However, at the time, COVID-19 vaccination coverage was still too low [29] to explain the substantial partisan differences observed. Furthermore, the recommendation effect may



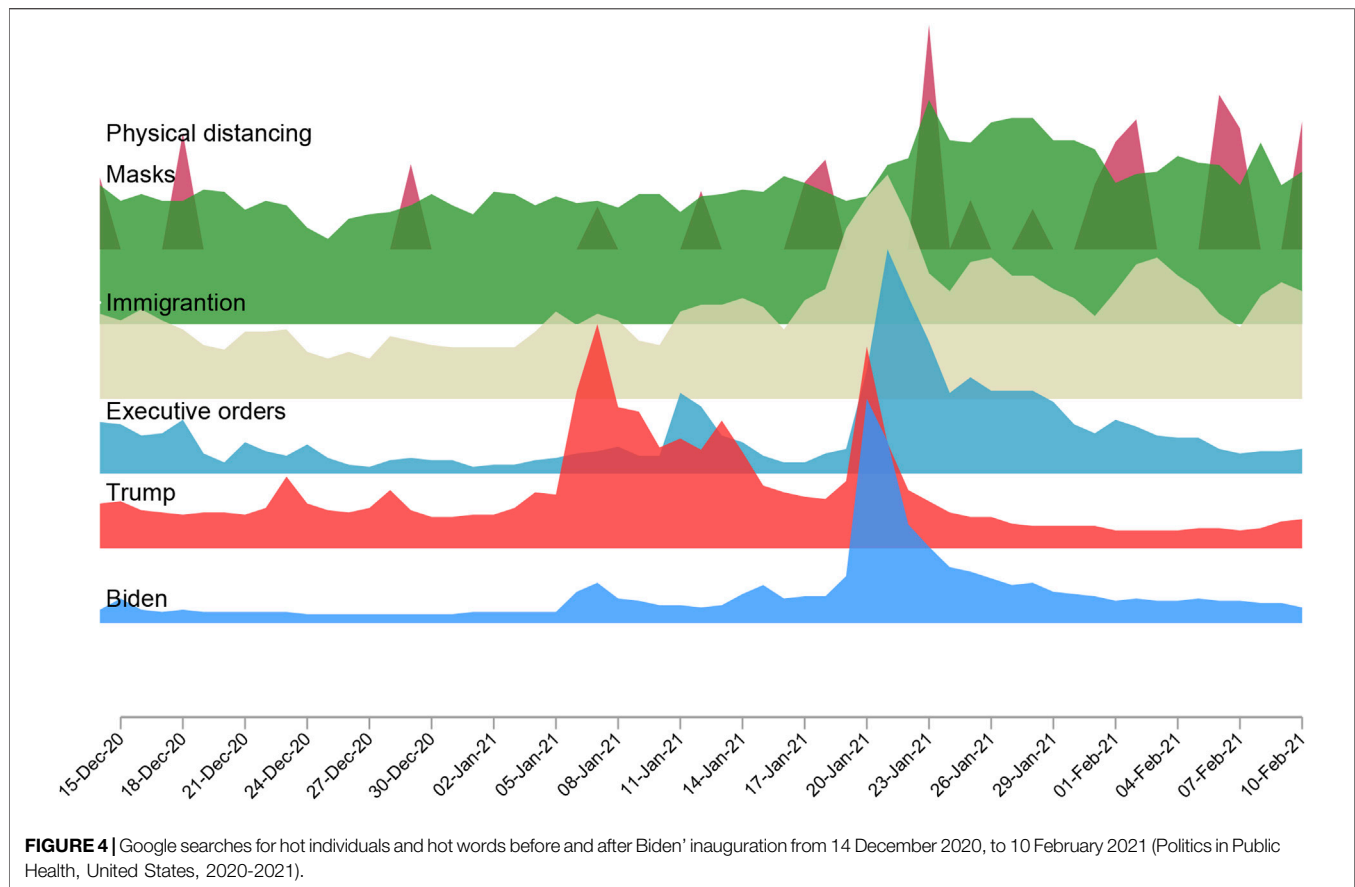
plausibly account for partisan divide in declining COVID-19 vaccine refusal rates due to distrust of COVID-19 vaccines, but not for partisan divide in declining COVID-19 vaccine refusal rates due to distrust of the government. Second, the supply of COVID-19 vaccines also increased in the month after Biden's inauguration, which might result in daily COVID-19 vaccination rates exhibiting more of the previously inherent partisan differences in COVID-19 vaccine attitudes. However, if partisan differences in COVID-19 vaccine attitudes had not worsened, we would expect a steady widening trend in daily COVID-19 vaccination rates, not the sharp increase in partisan differences observed in our results. Additionally, the supply of COVID-19 vaccines at the state level was also controlled in our model.

The heavy politicization of COVID-19 vaccines remains a core reason for these divides [11]. Although Biden called for nonpartisan support for vaccination, his Democratic identity may limit his influence on Republican attitudes [30–32]. Depoliticizing public health issues, therefore, becomes essential to foster trust across party lines. For instance, bipartisan messaging, as seen in former President Trump's March 2021 call for vaccination, can be a promising example [33, 34]. However, remedying the impacts of vaccine politicization requires consistent pro-vaccine messaging from Trump and other Republican elites. Such cues have been shown to effectively increase vaccination rates among Republicans [35],

though Republican elite engagement in this effort remains limited.

Although the public had long known that Joe Biden would be inaugurated in January 2021, the event may still have contributed to a widening of partisan divides in COVID-19 vaccine attitudes and uptake. This suggests that affective partisan responses to political events, such as leadership transitions, also drive intensifying partisan divides. While affective responses to political events are a natural byproduct of democratic politics and not necessarily bad [26], it does not mean their negative impact cannot be mitigated. Reducing partisan framing and biases rooted in in-group versus out-group thinking is essential for managing these responses [36]. Approaches that stress shared identities, such as American identity [37], or counter misperceptions about partisan groups [38] could help depolarize public health responses. This implies that during political events like presidential transitions, public health messaging should aim to bridge partisan divides, emphasizing common health goals and avoiding politicized framing.

This study's focus on the short-term impact of a presidential transition offers insight into how political polarization influences public health policy. Future health communication strategies should consider the broader political context and proactively work to reduce the influence of partisan identities on health behaviors. Long-term solutions may include bipartisan health campaigns and cross-party engagement in public health messaging to create unified responses to crises.



One limitation of this study is that the county/state-level analysis is ecological in nature, so the findings should be interpreted with caution. Additionally, due to data limitations, sensitivity analyses for the vaccine attitude outcomes could not be conducted. Future research with more granular data is necessary to address this issue. Moreover, we used COVID-19 vaccination rates among individuals aged 65 and older as a proxy for overall vaccine uptake, as vaccination for the general population had not yet begun at the time of the presidential transition. Seniors have distinct patterns of partisan identity, with higher levels of partisanship [39] and stronger partisan loyalty due to the life-cycle effect [40] and longer attachments to political parties [41]. Moreover, seniors' health insurance status and media consumption habits differ from those of other age groups. As such, our findings on vaccination uptake may not be fully representative of the general population. Furthermore, the mechanisms underlying these patterns require further investigation. Future studies should aim to verify the relative impact of these mechanisms by analyzing pre- and post-presidential change surveys, incorporating measures of affective polarization, trust in government, and other relevant variables.

Conclusion

This study suggests that, following President Biden's inauguration, partisan divides in COVID-19 vaccine attitudes

and uptake among older adults (65+) may have widened, potentially driven by elite cues, partisan identity, affective polarization, and trust in government. These findings highlight the importance of depoliticized public health messaging, bipartisan leadership, and targeted interventions in politically polarized contexts. Practical implications include the need to rebuild trust in government, foster cross-party collaboration, and reframe public health initiatives around shared national goals.

Given the study's focus on older adults, future research should examine vaccine attitudes and uptake among younger populations, who may be shaped by different political socialization processes. Such studies could explore additional political variables, including ideological extremity, susceptibility to misinformation, media consumption habits, and the influence of social media on political attitudes. This would offer a more comprehensive understanding of how political identities shape health behaviors across different demographic groups.

AUTHOR CONTRIBUTIONS

ZZ, CS, and HF designed the research and approved the final version; HF performed research, conducted the analysis, and drafted the paper; QZ provided assistance and suggestions for analysis and revision. All authors contributed to the article and approved the submitted version.

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CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

REFERENCES

- Mason L. *Uncivil Agreement: How Politics Became Our Identity*. Chicago: University of Chicago Press (2018). p. 192.
- Iyengar S, Krupenkin M. Partisanship as Social Identity; Implications for the Study of Party Polarization. *The Forum* (2018) 16(1):23–45. doi:10.1515/for-2018-0003
- Dimock M, Doherty C, Kiley J, Oates R. *Political Polarization in the American Public*. Washington, DC: Pew Research Center (2014). p. 124.
- McConnell C, Margalit Y, Malhotra N, Levendusky M. The Economic Consequences of Partisanship in a Polarized Era. *Am J Polit Sci* (2018) 62(1):5–18. doi:10.1111/ajps.12330
- Morris DS. Polarization, Partisanship, and Pandemic: The Relationship between County-level Support for Donald Trump and the Spread of Covid-19 during the Spring and Summer of 2020. *Soc Sci Q* (2021) 102(5): 2412–31. doi:10.1111/ssqu.13053
- Asch DA, Luo C, Chen Y. Reports of COVID-19 Vaccine Adverse Events in Predominantly Republican vs Democratic States. *JAMA Netw Open* (2024) 7(3):e244177. doi:10.1001/jamanetworkopen.2024.4177
- Gadarian SK, Goodman SW, Pepinsky TB. Partisanship, Health Behavior, and Policy Attitudes in the Early Stages of the COVID-19 Pandemic. *PLoS ONE* (2021) 16(4):e0249596. doi:10.1371/journal.pone.0249596
- Pennycook G, McPhetres J, Bago B, Rand DG. Beliefs about COVID-19 in Canada, the United Kingdom, and the United States: A Novel Test of Political Polarization and Motivated Reasoning. *Pers Soc Psychol Bull* (2022) 48(5): 750–65. doi:10.1177/01461672211023652
- Allcott H, Boxell L, Conway J, Gentzkow M, Thaler M, Yang D. Polarization and Public Health: Partisan Differences in Social Distancing during the Coronavirus Pandemic. *J Public Econ* (2020) 191:104254. doi:10.1016/j.jpubeco.2020.104254
- Levendusky MS. Clearer Cues, More Consistent Voters: A Benefit of Elite Polarization. *Polit Behav* (2010) 32(1):111–31. doi:10.1007/s11109-009-9094-0
- Albrecht D. Vaccination, Politics and COVID-19 Impacts. *BMC Public Health* (2022) 22(1):96. doi:10.1186/s12889-021-12432-x
- Callaghan T, Moghtaderi A, Lueck JA, Hotez P, Strych U, Dor A, et al. Correlates and Disparities of Intention to Vaccinate against COVID-19. *Soc Sci Med* (2021) 272:113638. doi:10.1016/j.socscimed.2020.113638
- Soares P, Rocha JV, Moniz M, Gama A, Lares PA, Pedro AR, et al. Factors Associated with COVID-19 Vaccine Hesitancy. *Vaccines* (2021) 9(3):300. doi:10.3390/vaccines9030300
- Liu R, Li GM. Hesitancy in the Time of Coronavirus: Temporal, Spatial, and Sociodemographic Variations in COVID-19 Vaccine Hesitancy. *SSM Popul Health* (2021) 15:100896. doi:10.1016/j.ssmph.2021.100896
- Viswanath K, Bekalu M, Dhawan D, Pinnamaneni R, Lang J, McCloud R. Individual and Social Determinants of COVID-19 Vaccine Uptake. *BMC Public Health* (2021) 21(1):818. doi:10.1186/s12889-021-10862-1
- Jones DR, McDermott ML. Partisanship and the Politics of COVID Vaccine Hesitancy. *Polity* (2022) 54(3):408–34. doi:10.1086/719918
- Agarwal R, Dugas M, Ramaprasad J, Luo J, Li G, Gao G. Socioeconomic Privilege and Political Ideology Are Associated with Racial Disparity in COVID-19 Vaccination. *Proc Natl Acad Sci USA* (2021) 118(33): e2107873118. doi:10.1073/pnas.2107873118
- Centers for Disease Control and Prevention. COVID-19 Vaccinations in the United States, County (2022). Available online at: <https://data.cdc.gov/Vaccinations/COVID-19-Vaccinations-in-the-United-States-County/8xxk-amqh> (Accessed October 25, 2022).
- Zhang L, Darzi A, Ghader S, Pack ML, Xiong C, Yang M, et al. Interactive COVID-19 Mobility Impact and Social Distancing Analysis Platform. *Transp Res Rec* (2023) 2677(4):168–80. doi:10.1177/03611981211043813
- Qian N. Missing Women and the Price of Tea in China: The Effect of Sex-specific Earnings on Sex Imbalance. *Q J Econ* (2008) 123(3):1251–85. doi:10.1162/qjec.2008.123.3.1251
- Nunn N, Qian N. The Potato's Contribution to Population and Urbanization: Evidence from A Historical Experiment. *Q J Econ* (2011) 126(2):593–650. doi:10.1093/qje/qjr009
- Singh A, Kaur SP, Shahanshah MFH, Sharma B, Chaudhary VK, Gupta S, et al. COVID-19 Vaccination. *A Clin Perspective* (2022) 472–93. doi:10.1002/9781119789741.ch22
- Huddy L, Mason L, Aaroe L. Expressive Partisanship: Campaign Involvement, Political Emotion, and Partisan Identity. *Am Polit Sci Rev* (2015) 109(1):1–17. doi:10.1017/S0003055414000604
- West EA, Iyengar S. Partisanship as a Social Identity: Implications for Polarization. *Polit Behav* (2022) 44(2):807–38. doi:10.1007/s11109-020-09637-y
- Van Bavel JJ, Pereira A. The Partisan Brain: An Identity-Based Model of Political Belief. *Trends Cogn Sci* (2018) 22(3):213–24. doi:10.1016/j.tics.2018.01.004
- Hernández E, Anduiza E, Rico G. Affective Polarization and the Salience of Elections. *Elect Stud* (2021) 69:102203. doi:10.1016/j.electstud.2020.102203
- Bavel JJV, Baicker K, Boggio PS, Capraro V, Cichocka A, Cikara M, et al. Using Social and Behavioural Science to Support COVID-19 Pandemic Response. *Nat Hum Behav* (2020) 4(5):460–71. doi:10.1038/s41562-020-0884-z
- Markus GB, Converse PE. A Dynamic Simultaneous Equation Model of Electoral Choice. *Am Polit Sci Rev* (1979) 73(4):1055–70. doi:10.2307/1953989
- Centers for Disease Control and Prevention. COVID Data Tracker (2022). Available online at: <https://covid.cdc.gov/covid-data-tracker>. (Accessed October 23, 2022).
- Slothuus R, Bisgaard M. How Political Parties Shape Public Opinion in the Real World. *Am J Polit Sci* (2021) 65(4):896–911. doi:10.1111/ajps.12550
- Goren P, Federico CM, Kittilson MC. Source Cues, Partisan Identities, and Political Value Expression. *Am J Polit Sci* (2009) 53(4):805–20. doi:10.1111/j.1540-5907.2009.00402.x
- Kam CD. Who Ties the Party Line? Cues, Values, and Individual Differences. *Polit Behav* (2005) 27(2):163–82. doi:10.1007/s11109-005-1764-y
- Halon Y. *Trump Urges All Americans to Get COVID Vaccine: "It's a Safe Vaccine" and It Works*. New York: Fox News (2021). Available online at: <https://www.foxnews.com/media/trump-urges-all-americans-to-get-covid-vaccine-its-a-safe-vaccine> (Accessed October 25, 2022).
- LeBlanc P. *Trump Urges Americans to Get COVID-19 Vaccine: I Would Recommend it*. Atlanta: CNN (2021). Available online at: <https://www.cnn.com/2021/03/16/politics/donald-trump-covid-19-vaccine/index.html> (Accessed October 25, 2022).

GENERATIVE AI STATEMENT

The authors declare that no Generative AI was used in the creation of this manuscript.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.ssph-journal.org/articles/10.3389/ijph.2025.1608162/full#supplementary-material>

35. Pink SL, Chu J, Druckman JN, Rand DG, Willer R. Elite Party Cues Increase Vaccination Intentions Among Republicans. *Proc Natl Acad Sci USA* (2021) 118(32):e2106559118. doi:10.1073/pnas.2106559118
36. Iyengar S, Lelkes Y, Levendusky M, Malhotra N, Westwood SJ. The Origins and Consequences of Affective Polarization in the United States. *Annu Rev Polit Sci* (2019) 22(1):129–46. doi:10.1146/annurev-polisci-051117-073034
37. Levendusky MS. Americans, Not Partisans: Can Priming American National Identity Reduce Affective Polarization? *J Polit* (2018) 80(1):59–70. doi:10.1086/693987
38. Ahler DJ, Sood G. The Parties in Our Heads: Misperceptions about Party Composition and Their Consequences. *J Polit* (2018) 80(3):964–81. doi:10.1086/697253
39. Campbell A, Converse PE, Miller WE, Stokes DE. *The American Voter*. Chicago: University of Chicago Press (1980). p. 576.
40. Lisi M. Partisanship and Age Effects in Recent Democracies: Southern Europe from a Comparative Perspective. *Comp Eur Polit* (2015) 13(4):493–513. doi:10.1057/cep.2014.3
41. Bartle J, Bellucci P. *Political Parties and Partisanship: Social Identity and Individual Attitudes*. London: Routledge (2014). p. 256.

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