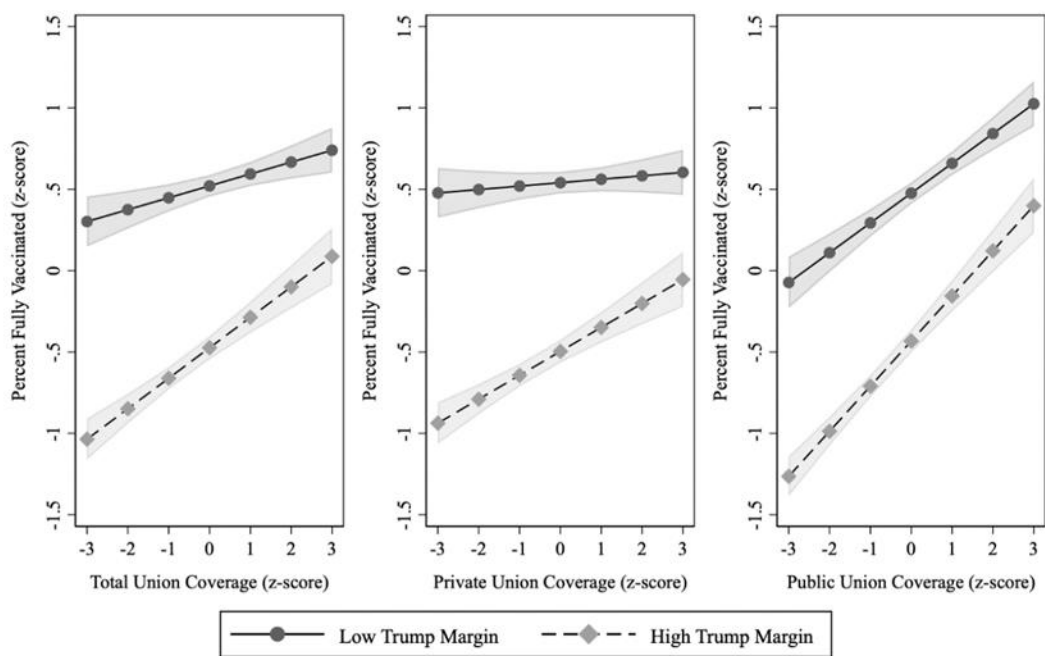

UNIONS, DEMOCRACY, AND THE POLITICS OF VACCINATION



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The COVID-19 pandemic posed significant challenges for U.S. workers, even as vaccination efforts ramped up. The intersection of the pandemic with the workplace, especially in essential occupations like food production, nursing homes, and hospitals, has been complex and shaped by myriad societal forces, including longstanding structural inequalities, levels of worker power, and the rising tension between democracy and individual freedom (Carlsten et al., 2021). As the country has navigated successive waves of the pandemic, fault lines in worker vulnerabilities have become evident as the U.S. has made halting progress toward a more fully vaccinated population. A key site of the war on the pandemic has been the workplace, a potential breeding ground for the virus, where most adults spend a majority of waking hours in close proximity with non-familial workers and customers (Sandal and Tildiz, 2021). Yet, mounting evidence shows that workers who had a voice in their workplace were successful in advocating for the right to work from home, receive personal protective equipment (PPE), obtain paid sick leave, and implement protocols to maintain a safe and healthy workplace (Hertel-Fernandez et al., 2020), and that many of these protections were extended to more vulnerable workers and ordinary citizens. Even so, millions of workers faced the impossible decision of whether to prioritize their much-needed income or their personal and family's health and safety.

Notwithstanding the role of workplace democracy in mitigating the crisis, the pandemic

has posed broader questions for American democracy as longstanding political divisions animated the uneven response to the pandemic, including whether or not to practice social distancing, wear masks, participate in contact tracing, or receive vaccines. As the pandemic worsened, the principle of individual freedom, autonomy, and choice, so prominent in the American character, seemed to stymie the efforts of democracy to devise a collective response to the pandemic. The impasse was exacerbated by a perfect storm of misinformation and disinformation about the virus, much of it fomented by former President Trump and his acolytes in politics and the media and amplified among his millions of followers through social media (Evanega et. al., 2021).¹ Early on, public health advisories aimed at mitigating the effects of the pandemic were politicized by Trump who minimized the effects of the virus while prioritizing “opening of the economy” in the run-up to the 2020 election. In an unprecedented response to a national crisis, Trump sowed deep mistrust in science, medical experts, and state and local authorities who took necessary measures to protect citizens during the public health crisis.

Many adopted a tribal opposition to all public health measures intended to reduce the spread of COVID-19, characterizing them as attacks on individual freedom and liberties. Aggressive, even violent, memes threatening professional or personal harm to those who advocated public health measures went viral on rightwing social media. Alternatively,

¹ In a comprehensive review of English-language media sources, Evanega et. al (2021) identified 522,472 separate instances of COVID

misinformation, much of it involving false conspiracy theories to explain the source of the virus.

progressive groups, including most labor unions, steadfastly promoted a deeper and more democratically-anchored understanding of freedom in which one's personal freedom should not impinge upon the freedom of others to fashion a collective response that would eliminate the virus and restore public health (Trumka, 2020).

In this research report, we explore several questions related to the nation's response to the pandemic. Recognizing that most public health experts viewed vaccination as the only certain path to defeat the virus, we ask what role, if any, union membership, democracy, and politics played in shaping adult vaccination rates. Using vaccination data from 3,112 U.S. counties in July of 2021, our cross-sectional analysis finds strong evidence that counties with higher union coverage and higher voter turnout are associated with higher percentages of adults vaccinated, while counties with higher levels of support for Trump have lower percentages of adults vaccinated. Moreover, we find that the positive effects of union density are greater in counties with higher rates of voter turnout and higher levels of support for Trump, revealing a complex relationship between democracy, unions, and political preferences. In what follows, we briefly review the theoretical underpinnings for the study, describe our data and methodology, present our results, and conclude by discussing the findings with an eye toward understanding the role that workplace and political democracy can play in shaping responses to large-scale crises such as the COVID-19 pandemic.

THE BACKGROUND: UNIONS, DEMOCRACY, AND POLITICS

Unions

Unions have long been regarded as effective advocates for workers' interests in two arenas—the economy and politics. Through collective bargaining and other concerted activities, unions win economic benefits for their members which often also spill over to non-union

workers (Freeman and Medoff, 1984). In the political arena, unions promote workers' interests by influencing legislation and elections through member participation in the political process—an important check on the influence of money spent by capitalists and other elites to influence politics (Greenstone, 1969).

However, a third, often overlooked, arena in which unions play a vital role is civil society, wherein citizens form voluntary associations to pursue common purposes (Wright and Rogers, 2015). Like churches, civic associations, sports clubs, and fraternities and sororities, labor unions promote their members' common interests. Unions, however, are unique in that they are embedded in the workplace, a site where citizens spend a majority of their waking hours and are comprised almost exclusively of regular working people who otherwise hold little power. In civil society, unions typically advocate for a range of services, education, charity and other benefits not only for their members but also for their communities and society at large. As such, unions are “class-based organizations” with vested interests in building a broad collective consciousness that extends beyond their own members. In short, unions are important for shaping what political theorists call a *demos*—a constituency with shared identity and common interests—which is crucial for a vital democracy.

Putnam (2000) has documented the long-term decline in participation in civic associations, a trend that has affected union membership in the U.S. and other advanced democracies. Even so, the U.S. ranks last among 24 affluent OECD countries in the percent of workers unionized. While over 50% of workers in the Scandinavian countries are represented by unions and the average for all 24 countries is about 30%, currently just 11% of U.S. workers are union members—a significant decline from the 35% who were unionized in the 1950s. This low figure belies substantial variation in the percent of workers unionized within the 50 states, ranging from 3.8% in South Carolina to 25.6% in Hawaii, a fact that underscores the variability of worker

power in the U.S.

While union decline is recognized as a key contributor to rising income inequality (Western and Rosenfeld, 2011), less often considered is its impact on democracy and social cohesion. Early proponents of industrial democracy (e.g., Webb and Webb, 1897) extolled the virtues of trade unions in providing a strong worker voice in the workplace. Wright and Rogers (2015) argue that unions play a critical role in democratic societies by creating “organic solidarities” that are embedded in one vitally important sphere of most people’s lives—the workplace. Unions not only help build shared interests and capacities for participation in electoral politics, but they also inject varying degrees of democracy into the otherwise authoritarian sphere of employment.

Since the first U.S. case of COVID was identified in January 2020, unions have played a vital role for workers, particularly those in precarious work arrangements. Essential workers like those in grocery stores, warehouses, and assembly lines were most vulnerable, typically working with inadequate safety protections and often at wages that do not fairly reflect the value their work adds to society. Under the Trump Administration, the Occupational Safety and Health Administration was missing in action, refusing to issue emergency infectious disease standards for healthcare workers. Guidance issued from the Centers for Disease Control and Prevention (CDC) was uneven and inadequate, and compliance was erratic. A unified message for the workplace was lacking, giving employers leeway to disregard the guidance in the pursuit of profits.

Facing federal government inaction and an inadequate response by many employers, unions and organized workers across the U.S. used their collective voice to demand better COVID-19 safety and health protections (Greenhouse, 2020). From nurses to fast food workers, and warehouse workers to librarians, workers fought for PPE, cleaner workplaces, hazard pay and, where possible, the ability to

telecommute. Unions joined with worker centers and other allies to support better conditions for non-union workers, including immigrant workers in precarious work arrangements. They fought for furlough plans to keep fellow workers in their jobs rather than getting laid off. To win these protections, they signed letters, organized sickouts, filed grievances, bargained and, in some cases, staged work stoppages. These actions contributed to the issuance of executive orders by several governors, mostly in Democratic states, to protect workers. One such example attained by the Protect Workers Coalition in New Jersey—a diverse coalition of workers, worker centers, community groups, advocacy organizations, and labor unions—required essential employers to have infectious control practices, social distancing measures, mask requirements and notification of workers of any known exposure to COVID-19 at the worksite.

A Columbia University study found that unionized essential workers reported better COVID-19 workplace practices and outcomes than non-union workers (Hertel-Fernandez et al., 2020). Adjusting for demographic and workplace factors, union members were more likely to report using PPE regularly at work, to receive PPE and other disinfecting resources from their employers, to receive paid sick leave, and to report being tested for COVID-19. The Economic Policy Institute reported that unionized workers were able to secure enhanced safety measures, additional premium pay, paid sick time and furloughs or work-share arrangements to save jobs during the pandemic (McNicholas et al., 2020).

Due to the relationship between unions and democratic participation, the fruits of union efforts often extended beyond their own members. As one example, Engeman (2021) finds that unions played a pivotal role in passing leave time legislation in some states from 1983 to 2016. Such legislation was in place to benefit both unionized and non-unionized workers during the pandemic, displaying how forging a

“will of the people” helped to overcome collective action failures.

However, despite linkages between unions and improved outcomes for workers during the pandemic, the dominant media narrative focused largely on union reluctance or opposition to adopting vaccine mandates. In truth, many unions have simultaneously promoted vaccination among their members, including educating them about the safety and effectiveness of vaccines and even hosting vaccine clinics for members and the broader community, while also opposing unilateral mandates by employers. The main issue involves the infringement upon the collective bargaining process which compels employers and unions to negotiate changes to wages, hours and working conditions. There is ample anecdotal evidence of both support for, and opposition to, vaccine mandates among unionized workers. For example, police unions have openly opposed vaccination mandates while teachers’ unions have supported them. In this study, we seek to answer the question empirically—what is the relationship between unionization rates and vaccination rates? Based upon our reading of the literature, we hypothesize the following: *Net of other covariates, union coverage will be positively related to the rate of COVID vaccinations.*

Democracy

Wright and Rogers (2015:406) conceive of democracy as rooted in the value that “all people should have broadly equal access to the necessary means to participate meaningfully in decisions over things which affect their lives.” As such, these decisions can be divided into two broad, but separate, domains: private decisions, which affect people’s lives as separate persons and have no impact on others, are the domain of individual freedom, while public decisions, which affect their lives as members of a broader community and do impact others, are the domain of democracy. From this perspective, individual freedom and democracy are alternative

expressions of the unified value of self-determination. That said, the line of demarcation between individual freedom and democracy can be ambiguous and fraught with conflict. As evidenced by scores of hot-button political issues such as gun rights, abortion, or school prayer, whether a decision should be made individually or collectively can become highly contested. What some may view as a legitimate issue for collective decision-making, others may view as a matter of personal choice. As evidenced during the pandemic, the personal actions of individuals—such as whether or not to wear face masks in public—can profoundly affect the collective well-being of the community as a whole.

Wright and Rogers (2015) further contend that, in a democracy, decisions that affect people’s “common fate and common interests” should reflect the collective will of the citizenry as determined by the choices of equal citizens. In order to have “equal citizens” making collective decisions, citizens must have both equal rights to participate in the democratic process as well as equal access to the practical means of political participation. In practice, there are many ways that the “equal citizen” principle can be violated including the myriad voter suppression techniques that have been used to limit access to the polls for Black Americans and other vulnerable citizens. Similarly, powerful actors in business can gain greater voice in the political process through lobbying and political action campaigns, while government actors can distort political representativeness through gerrymandering. Further, privately funded political campaigns in the U.S. incentivize wealthy individuals and corporations to make huge campaign contributions that buy access to politicians and sway election outcomes, creating an electoral system where the willingness to pay trumps the willingness to act. All these factors—not to mention uniquely American aberrations like the Electoral College, the unrepresentative U.S. Senate, and the lack of statehood for the District of Columbia and Puerto Rico—

undermine the “equal citizen” principle that undergirds a true democracy.

Another problem that afflicts all democracies is rational ignorance, or what some have called the “free rider problem” in democracy (Wright and Rogers, 2015). Rational ignorance occurs when citizens believe that the costs of political participation exceed the benefits, leading them to not participate at all or to participate using low-quality information. Ultimately, a vibrant democracy depends on a fully informed and engaged citizenry. It requires that citizens have access to high quality information about candidates and issues and that they invest the time and effort required to become knowledgeable. But many citizens conclude that obtaining high-quality information is too costly and, moreover, that their single vote is unlikely to affect the final outcome. So, the rational strategy of many citizens is to remain ignorant about political matters and devote their time and energy to other things. If they do choose to participate in politics, they do so as “low-information voters” with information that is of low cost and poor quality, that is, information they can obtain cheaply from political ads, their family and friends, and social media. Even though they value the benefits of living in a democracy, they “free-ride” on the participation of others and trust that the “democraticness” of society will continue. As more citizens choose a path of rational ignorance, the quality of democracy deteriorates. Rather than enjoying a robust democracy, characterized by the participation of an active and informed citizenry, citizens live in a thin democracy, characterized by apathy and, at best, superficial participation limited to voting.

A passive citizenry is incompatible with a meaningful democracy. One of the hallmarks of a thin democracy is low voter turnout, either because some citizens face high obstacles in exercising the vote or their own apathy. Thus, in this article we use voter turnout as our indicator of democracy. The U.S. ranks 22nd among 24 affluent capitalist democracies in voter turnout in

the most recent national election, just 55.7% compared to an average of 68.7%, suggesting that the rational ignorance problem is more prevalent in the U.S. than in comparable countries. Yet, there is substantial variation in state-level voter turnout ranging from 51.9% in Arkansas to 74.3% in Minnesota. (The county-level data used in this analysis reveals even more intra-state variation.) Since we expect that voter turnout accurately captures the quality of a democracy, we pose the following hypothesis: *Net of other covariates, voter turnout will be positively related to the rate of COVID vaccinations.*

Politics

As the COVID-19 virus penetrated the public consciousness in January 2020 it came to dominate the final 10 months of the Trump presidency and set off a period of extreme politicization of the public health response. Initially, Trump downplayed the severity of the crisis, arguing that the virus was no worse than the flu and that it would go away with the warm weather in April—even though in real time he confided to journalist Bob Woodward that the virus was “deadly stuff” and admitted “I always wanted to play it down. I still like playing it down, because I don’t want to create a panic” (Forgey and Choi, 2020). As COVID-19 cases escalated, Trump began to shift blame to others, blaming the Chinese for their inadequate response to the outbreak, blaming Mexican migrants for carrying the virus across the southwest border, blaming the media for exaggerating the severity of the crisis, blaming the Obama administration for leaving his administration an insufficient stockpile of medical supplies, blaming Democratic governors for requesting too much medical equipment from the federal government (and even claiming the pandemic was a “Democratic hoax”), blaming the increase in cases on “too much testing,” and blaming health experts for alarming the public about the consequences of the pandemic (Paz, 2020).

Meanwhile, Trump’s response in dealing with outbreaks among many frontline workers exacerbated the crisis. One of the first outbreaks in nursing homes was made worse by aggressive deregulation in the industry in the prior three years of the Trump administration which incentivized nursing home corporations to hollow out, carve up and exploit for profit the long-term health-care sector. In an effort to enhance profitability of corporate owners and shield them from financial liability, nursing homes were understaffed and without essential equipment as well as less exposed to fines for violation of health standards. Once the pandemic began, Trump officials failed miserably, delivering broken and unusable equipment and failing to deploy the resources of relevant federal agencies to resolve the crisis. As nursing home staff called in sick because of the virus or to avoid working in an unhealthy workplace, fewer staff were available to handle higher numbers of sick residents, and part-time workers were hired to fill in at multiple facilities, which helped spread the virus. Prioritizing anti-worker ideology over public health, Trump officials shunned calls for premium hazard pay and paid sick leave for nursing home workers and temporary housing to quarantine them from their families. When Congress passed a \$175 million package in emergency funding for health care workers, Trump was slow to distribute the funds and allocated only \$19.5 billion to nursing homes, stalling the acquisition of much-needed PPE, testing, and staff and leaving in the wake nearly 100,000 deaths of staff and residents by the time he left office.

Similarly deadly outbreaks of COVID occurred in March and April of 2020 in meatpacking plants where hundreds of workers worked in close proximity with each other. Early in the pandemic, America’s largest meat companies failed to adopt adequate measures to mitigate the virus’s spread in their facilities, leading to some of the earliest and largest outbreaks among an already vulnerable and precarious workforce. The rapid spread of the

virus resulted in high rates of avoidable illness and death among plant workers, their families, and communities, so that counties with meatpacking plants exhibited much higher infection rates than adjacent counties without them. In April, at the behest of industry executives, a Trump executive order compelled meatpacking plants to stay open as part of the nation’s “critical infrastructure” and also provided liability protection for owners from lawsuits by employees who became sick or died. About that time, the United Food and Commercial Workers International Union reported that at least 5,000 meatpacking workers and 1,500 food processing workers had contracted the virus, with 20 confirmed dead. Meager mitigation efforts by corporations, such as wearing face masks and placing protective shields between workstations, did little to stem the raging virus. By the end of Trump’s administration, about 86,000 workers in the industry had tested positive for the virus and 423 had died. Similar scenarios played out in other industries—hospitality and restaurants, schools and universities, hospitals and prisons, grocery stores and airlines—as the nation staggered through the pandemic with incompetent national leadership. As the Trump administration floundered, much of the responsibility for arresting the virus was pushed onto states and local government resulting in a patchwork of mitigation strategies, pernicious competition among states for scarce resources such as PPE, ventilators, and hospital beds, and conflicting policies between state and local jurisdictions. As states charted separate courses to combat the virus based on their own circumstances, it undermined the possibility for a coordinated national response. Filtered through the omnipresent prism of red-and-blue politics, states pursued starkly different policies which accelerated the politicization of the virus. Governors like Republican Ron DeSantos of Florida, who minimized the health effects of the virus and advocated keeping the economy open for tourism and business, were lauded by Trump,

whereas governors like Democrat Gretchen Whitmer of Michigan, who implemented state lockdowns of businesses and schools to mitigate the crisis, were the target of Trump's wrath and even a kidnapping plot (Scher, 2020).²

As the virus raged throughout the summer and fall of 2020, public messaging about the state of the pandemic and mitigation strategies was characterized by chaos and confusion. Public health officials struggled to convey a consistent message about the importance of social distancing, masking, and stay-at-home orders, while the Trump administration sent mixed or muted signals. Many conservative politicians mostly ignored public health officials' advice and prioritized keeping the economy open. Trump's own public signaling vacillated between tepid and often qualified support for the emerging public health consensus on the virus, the purveying of misinformation about the virus (including famously touting a "disinfectant that knocks it out in a minute"), and much more enthusiastic advocacy for keeping the economy open. In the run-up to the 2020 presidential election facing an economic slowdown and rising unemployment, Trump's urgency to keep the economy open became the wedge issue to distinguish himself from Biden. In the first debate, Trump falsely claimed that Biden wanted an economic shutdown: "He wants to shut down this country, and I want to keep it open." In response, Biden's campaign message was to "listen to the scientists" and "to do whatever it takes to save lives."

The stark contrast in the candidates' positions on the public health vs. economy debate was the key factor in Biden's victory in the 2020 presidential election. In this politically charged climate, the first doses of the Moderna and Pfizer vaccines became available in the

waning days of the Trump administration. The initial CDC rollout of the vaccines was bumpy, with state and local health departments struggling to implement vaccination programs in the face of surging COVID-19 cases, record-breaking hospitalizations, and growing disinformation about the virus. On January 11, President-elect Biden promised to provide 100 million doses in 100 days (a goal that his administration exceeded) and by March the first vaccines became widely available to seniors and later to all adults. On May 4, President Biden announced the ambitious goal of having 70% of American adults receive at least one dose of vaccine by July 4. Government and business leaders weighed in with numerous incentives to encourage people to get vaccinated including free beers, reduced Uber rides, free day care, paid time off from work and cash bonuses for employees, and, in the state of Ohio, a lottery to give away \$1 million cash prizes and free college tuition to a few lucky persons. By July 4, though, the nation fell several million doses short of Biden's goal.

The polarization of American politics, coupled with the confusion and disinformation of the Trump administration, accounted in large part for the collective action failure of the vaccination crisis of 2021. We suspect this political divide will be evident in our county-level data, as the rural-urban population divide has increasingly aligned with red-blue politics. Therefore, we derive the following hypothesis: *Net of other covariates, the Trump margin of victory will be negatively related to the rate of COVID vaccinations.*

DATA AND METHODS

The data for this analysis comes from the U.S. Counties Dataset, a longitudinal dataset

initially yielded to pressures from the tourism industry to keep the economy open before implementing a 14-day quarantine on travelers and a partial stay-at-home order (Scher 2020).

² In fairness, the governors' responses were not strictly partisan. Republican governor Mike DeWine of Ohio steered a responsible course that defied Trump's edicts about keeping the economy open, while Democratic Governor David Ige of Hawaii

comprised of publicly available economic, social and political variables for 3,143 U.S. counties from 1990 to 2020. Our analysis is limited to the 2020 cross-section. Alaska's 29 counties were dropped due to incomplete data, yielding a final sample of 3,112 counties. We follow a tradition in political science and political geography of using county-level data in election studies (Knack and Kropf 2003; Ambrosius, 2016; Sharif and Algara, 2021) because they permit researchers to examine important intra-state variation in political processes and use larger sample sizes to create greater statistical power in quantitative analyses.

The dependent variable is the percentage of adults, age 18 and over, who were fully vaccinated against COVID-19 in each county by July 4, 2021. This time point is based on the national goal set by President Biden for 70% of all adults to have at least one shot by that date. Vaccination rates were taken from the *Centers for Disease Control and Prevention's COVID Data Tracker* (Centers for Disease Control and Prevention, 2021).

The key independent variables in this analysis tap the central explanatory variables of unions, democracy and politics. We measure union strength by *total union coverage*, the percentage of a county's total labor force who are covered by union contracts. We decompose this variable into *private-sector union coverage* and *public-sector union coverage*, which are the percentage of private-sector, and public-sector workers, respectively, who are covered by union contracts. This facilitates comparison of the effectiveness of private- and public-sector union efforts to increase vaccination rates. To operationalize democracy, we employ a measure of voter turnout. Voter turnout is broadly recognized as the measure of civic participation that best gauges the health of the electoral process (Douglas, 2013). High voter turnout is considered a hallmark of thriving, robust democracies whereas low voter turnout is a telltale sign of rational ignorance and thin democracies (Wright and Rogers, 2015). We

measure the influence of politics with the *Trump margin of victory*, which is the percentage of voters who voted for Trump minus the percentage who voted for Biden in each county. This measure takes on negative values in counties where Biden's vote exceeded Trump's.

In addition to the main effects of these three central variables, we create two sets of interaction terms—*union coverage x voter turnout* and *union coverage x Trump margin of victory*—to explore the heterogeneous effects of union coverage on COVID vaccination rates. These interactions allow us to explore union effectiveness in fostering higher vaccination rates under varying contexts of voter turnout and Trump support. We also include several control variables to account for possible alternative explanations for varying vaccination rates, including labor force demographics, several measures of the economy, and the presence of other civil society organizations beyond unions which might effect vaccination rates.

All variables are measured in 2020 except the dependent variable, the percentage of adults who are fully vaccinated, which is measured in 2021. Thus, the model takes the form of a lagged regression model with all covariates being lagged one year. To address heteroskedasticity, we utilize weighted least squares regression in which counties are weighted proportionate to their population and we employ heteroskedasticity-robust standard errors. Following Kollmeyer (2018), we transformed all variables to z-scores to aid interpretation. This process transforms variables with different metrics to the same unit of measurement (i.e., standard deviations from the mean) which facilitates direct comparison of covariates' relative influence on the dependent variable. In other words, the parameter estimates take the form of standardized regression coefficients. Diagnostic tests revealed no evidence of multicollinearity.

RESULTS

In Table 1, we show the basic models

predicting the percentage of adults who were fully vaccinated by July 4, 2021. In Model 1, we see that total union coverage is positively and significantly related to vaccination rates ($\beta=.449$). The coefficient indicates that for a one standard deviation increase in union coverage, vaccination rates increase by .449 standard deviations. This result provides *prima facie* evidence that counties with a strong union presence tend to have higher vaccination rates. In Model 2, to tap the influence of democracy, we

add voter turnout and find that it is also positively related to vaccination rates ($\beta=.147$). Meanwhile, the inclusion of voter turnout only slightly reduces the effect of union coverage ($\beta=.442$). In Model 3, we add the Trump margin and find that it is strongly and negatively related to vaccination rates ($\beta=-.481$). Inclusion of the Trump margin causes a 45% decrease in the union coverage effect ($\beta=.243$) and a 39% increase in the voter turnout effect ($\beta=.204$), but all three variables remain statistically significant.

Table 1. Determinants of Percentage of Adults Who Are Fully Vaccinated by July 4, 2021 in U.S. Counties, N=3112

	Model 1		Model 2		Model 3		Model 4		Model 5	
	b	s.e.	b	s.e.	b	s.e.	b	s.e.	b	s.e.
Total union coverage	0.449 ***	0.016	0.442 ***	0.016	0.243 ***	0.015	0.143 ***	0.015	0.129 ***	0.016
Voter turnout			0.147 ***	0.016	0.204 ***	0.014	0.063 **	0.020	0.083 ***	0.021
Trump margin of victory					-0.481 ***	0.015	-0.548 ***	0.030	-0.519 ***	0.031
Pct. Female							0.021	0.014	0.008	0.015
Pct. non-Hispanic blacks							-0.338 ***	0.020	-0.309 ***	0.020
Pct. non-Hispanic Asians							-0.006	0.019	0.000	0.020
Pct. non-Hispanic other race							0.011	0.013	0.022	0.013
Pct. Hispanics							0.088 ***	0.019	0.115 ***	0.020
Pct. 65 and older							0.145 ***	0.016	0.145 ***	0.016
Pct. with college degrees							0.176 ***	0.030	0.171 ***	0.031
Pct. unemployed							-0.013	0.022	-0.016	0.022
Pct. change in employment							-0.011	0.019	-0.007	0.018
Relative income							0.061 **	0.021	0.075 ***	0.021
Social assistance organizations									0.075 ***	0.016
Religious organizations									-0.004	0.014
Social advocacy organizations									-0.078 ***	0.014
Civic and social organizations									0.045 **	0.014
Constant	0.000	0.016	0.000	0.016	0.000	0.014	0.000	0.012	0.000	0.012
R Squared	0.201		0.223		0.412		0.567		0.576	

* — $p < .05$; ** — $p < .01$; *** — $p < .001$ (two-tailed tests)

In Model 4, we add sociodemographic covariates. The gender composition of the county is not significantly related to vaccination rates, nor is the percent of non-Hispanic Asians and non-Hispanic other race. On the other hand, the percent non-Hispanic Black is significantly and negatively related to vaccination rates ($\beta=-.338$), the second strongest effect in the model. However, percent Hispanic is positively related with vaccination rates ($\beta=.088$) and, as expected, the percent of adults 65 or older has a significant,

positive effect ($\beta=.145$).

Two variables tapping labor market conditions, the unemployment rate and percent change in employment, are unrelated to vaccination rates. This somewhat surprising result is worthy of further investigation. However, the percent of residents with college degrees is positively related ($\beta=.176$), suggesting that counties with highly-educated populations are more likely to follow the scientific evidence that vaccines are effective in reducing the

transmission of COVID. Also, relative income is positively related with vaccination rates ($\beta=.061$), suggesting that relatively affluent counties tend to have higher vaccination rates than relatively impoverished counties.

Finally, in Model 5 we add variables representing four types of organizations that represent the broader strength of civil society. We find that two of them—social assistance organizations ($\beta=.075$) and civic and social organizations ($\beta=.045$)—have significantly positive effects on vaccination rates, while one—social advocacy organizations ($\beta=-.078$)—has a significantly negative effect. The effect of the fourth—religious organizations—is not statistically significant. The inclusion of the covariates in Models 4 and 5 alters the effects of the three central explanatory variables, but all three remain statistically significant. The effect of total union coverage is reduced by about 47% from its effect in Model 3 but retains significance ($\beta=.129$). Voter turnout's positive effect is diminished by about 59% ($\beta=.083$). On the other hand, the magnitude of the negative Trump margin effect increases by about 8% ($\beta=-.519$), making it the model's strongest effect. Although these results suggest that civil society has considerable influence on vaccination rates, our three central variables have stand-alone effects that cannot be easily ascribed to civil society alone.

Table 2, Model 1 shows that private-sector union coverage positively affects vaccination rates, but its effect ($\beta=.083$) is weaker than total union coverage ($\beta=.129$) in Table 2. Voter turnout and the Trump margin retain their significant positive and negative effects, respectively. Aside from minor differences in magnitude, the effects of other

covariates remain substantively unchanged. Since total union coverage is largely comprised of private-sector union coverage, it is not surprising that the results are quite similar to those of total union coverage in Table 2.

Model 2 replicates the full model substituting public-sector union coverage. Here, public-sector union coverage has a positive, significant effect ($\beta=.232$) that is significantly larger than not only total union coverage ($\beta=.129$) in Table 2 but also private-sector union coverage ($\beta=.083$), according to difference-of-slopes tests. Difference-of-slopes tests further revealed there were no significant differences in the effects of the covariates between Models 1 and 2.³ Overall, the R-squared of .591 for public-sector union coverage in Model 2 is statistically greater than the R-squared of .570 for private-sector union coverage in Model 1, suggesting that public unions provide more traction in gaining broader community support for mass vaccinations.

In Table 3, we examine the heterogeneous effects of union coverage on adult vaccination rates; specifically, we seek to understand how the effects of union coverage vary by different levels of voter turnout and politics as measured by the Trump margin of victory. That is, to what extent are the organic solidarities induced by unions effective in forging collective solutions to the health crisis when political democracy is more or less vibrant or when political support for vaccinations is stronger or weaker? We also extend the comparison in the previous Table to the heterogeneous effects of private-sector and public-sector union coverage. For this purpose, we construct two sets of interaction effects, one interacting union coverage with voter turnout and

³ However, we found some evidence that public-sector unions may mitigate the historic reticence of Black Americans to receive government-sponsored medical treatments. That is, results in Table 3 show that the negative effect of percent

non-Hispanic Black is reduced from Model 1 with private-sector union coverage ($\beta=-.325$) to Model 2 with public-sector union coverage ($\beta=-.269$), just short of conventional levels of statistical significance ($p<.052$) according to a difference-of-slopes test.

another interacting union coverage with the Trump margin. Our results are presented in two panels in Table 3. To conserve space, we do not

display the control variables, whose effects are substantively unchanged from those shown previously.

Table 2. Determinants of Percentage of Adults Who Are Fully Vaccinated by July 4, 2021 in U.S. Counties, Comparing Private-sector and Public-sector Union Coverage, N=3112

	Model 1		Model 2	
	b	s.e.	b	s.e.
Private-sector union coverage	0.083 ***	0.015		
Public-sector union coverage			0.232 ***	0.017
Voter turnout	0.093 ***	0.021	0.064 **	0.020
Trump margin of victory	-0.538 ***	0.031	-0.474 ***	0.031
Pct. Female	0.010	0.015	-0.001	0.014
Pct. non-Hispanic blacks	-0.325 ***	0.020	-0.269 ***	0.020
Pct. non-Hispanic Asians	0.008	0.020	-0.004	0.019
Pct. non-Hispanic other race	0.020	0.013	0.041 **	0.013
Pct. Hispanics	0.111 ***	0.020	0.130 ***	0.020
Pct. 65 and older	0.142 ***	0.016	0.154 ***	0.016
Pct. with college degrees,	0.164 ***	0.031	0.180 ***	0.030
Pct. unemployed	-0.003	0.023	-0.056 *	0.022
Pct. change in employment	-0.004	0.019	-0.005	0.018
Relative income	0.075 ***	0.021	0.060 **	0.021
Social assistance organizations	0.085 ***	0.016	0.053 ***	0.016
Religious organizations	-0.014	0.014	0.016	0.014
Social advocacy organizations	-0.079 ***	0.014	-0.062 ***	0.014
Civic and social organizations	0.049 ***	0.014	0.033 *	0.014
Constant	0.000	0.012	0.000	0.011
R Squared	0.570		0.591	

* — p < .05; ** — p < .01; *** — p < .001 (two-tailed tests)

Table 3. Determinants of Percentage of Adults Who Are Fully Vaccinated by July 4, 2021 in U.S. Counties, Heterogeneous Effects of Union Coverage, N=3112

Panel A. Interactions between Union Coverage and Voter Turnout						
Independent Variables	Model 1		Model 2		Model 3	
	Total Union Coverage		Private-sector Union Coverage		Public-sector Union Coverage	
	b	s.e.	b	s.e.	b	s.e.
Total union coverage	0.133 ***	0.015				
Private-sector union coverage			0.092 ***	0.015		
Public-sector union coverage					0.216 ***	0.017
Voter turnout	0.095 ***	0.020	0.103 ***	0.020	0.078 ***	0.020
Trump margin of victory	-0.532 ***	0.031	-0.551 ***	0.031	-0.500 ***	0.031
Total union coverage x Voter turnout	0.111 ***	0.012				
Private-sector union coverage x Voter turnout			0.110 ***	0.012		
Public-sector union coverage x Voter turnout					0.100 ***	0.012
Constant	-0.005	0.012	-0.004	0.012	-0.008	0.011
R Squared	0.588		0.582		0.600	

Panel B. Interactions between Union Coverage and Trump Margin of Victory						
Independent Variables	Model 4		Model 5		Model 6	
	Total Union Coverage		Private-sector Union Coverage		Public-sector Union Coverage	
	b	s.e.	b	s.e.	b	s.e.
Total union coverage	0.130 ***	0.016				
Private-sector union coverage			0.084 ***	0.015		
Public-sector union coverage					0.230 ***	0.017
Voter turnout	0.066 **	0.021	0.075 ***	0.021	0.049 *	0.021
Trump margin of victory	-0.497 ***	0.032	-0.518 ***	0.032	-0.454 ***	0.032
Total union coverage x Trump margin	0.057 ***	0.016				
Private-sector union coverage x Trump margin			0.063 ***	0.016		
Public-sector union coverage x Trump margin					0.047 **	0.015
Constant	0.023	0.013	0.022	0.013	0.022	0.013
R Squared	0.577		0.572		0.592	

* — p < .05; ** — p < .01; *** — p < .001 (two-tailed tests)

The following variables were included in the models but not shown to conserve space: Pct. female, Pct. non-Hispanic Black, Pct. non-Hispanic Asian, Pct. non-Hispanic other race, Pct. Hispanic, Pct. 65 and older, Pct. with college degrees, Pct. unemployed, Pct. change in employment, Relative income, Social assistance organizations, Religious organizations, Social advocacy organizations, and Civic and social organizations.

In Panel A, we focus on interactions between union coverage and voter turnout. Results for the main effects resemble previous results. All three measures of union coverage are positive and

significant, but public-sector union coverage yields a significantly larger effect ($\beta=.216$) than private-sector union coverage ($\beta=.092$) based on a difference-of-slopes test. Likewise, voter

turnout and the Trump margin of victory retain their significant effects and are of comparable magnitudes across all three models. Turning to the interaction effects, all three interactions between union coverage and voter turnout are positive and significant, suggesting that all three measures of union coverage increase vaccination rates faster in counties with high voter turnout.

In Panel B, we show interaction effects between union coverage and the Trump margin of victory. Again, the main effects mostly replicate previous results, with public-sector union coverage showing a significantly larger positive effect ($\beta=.230$) than private-sector union coverage ($\beta=.084$). All three interaction effects have significant positive effects, suggesting that they increase vaccination rates at a faster rate in counties with high Trump support. Thus, despite the dampening effect of high Trump margins on vaccination rates, these negative effects are mitigated to a greater degree in counties with strong union presence, suggesting a positive influence of the organic solidarities rooted in the mechanism of workplace democracy.

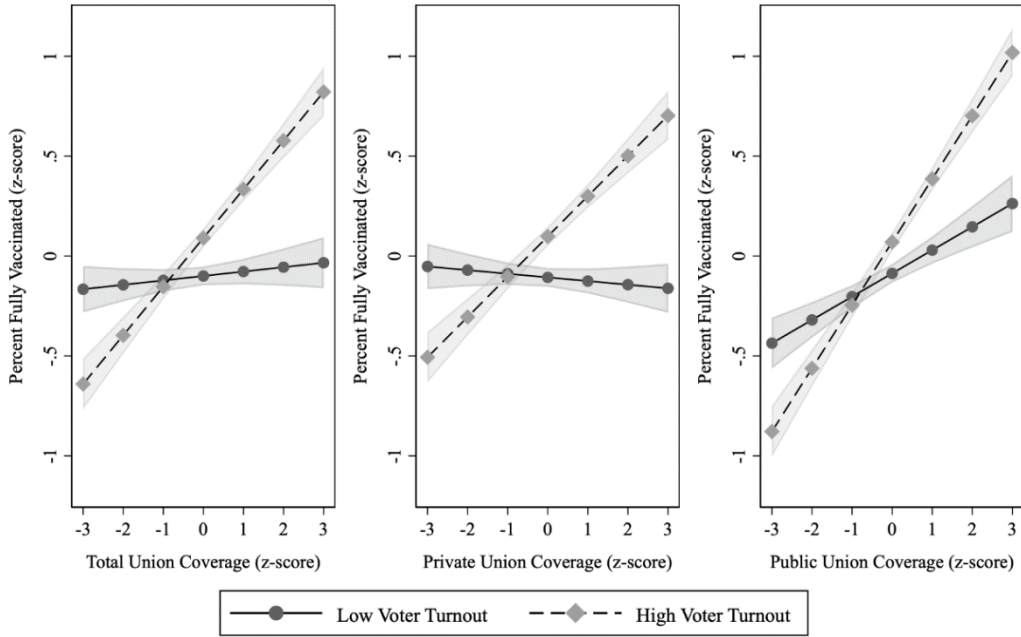
In Figure 1, we provide graphic representation of the two sets of interaction models showing separate effects on vaccination rates for each measure of union coverage. In Panel A, we plot the effects of the three measures of union coverage, holding all other covariates at their sample means, for counties with high voter turnout (defined as one standard deviation above the mean) compared to counties with low voter turnout (defined as one standard deviation below the mean). For counties with high voter turnout, all three measures of union coverage produce

upward-sloping lines indicating increases in vaccination rates, but the slope for public-sector union coverage is perceptibly steeper than the other two slopes. For counties with low voter turnout, however, the slope for private-sector union coverage tilts slightly downward, suggesting that private-sector unions have little influence in counties with low civic engagement. However, in those same low-turnout counties, the effect for public-sector unions is upward-sloping, suggesting that public-sector unions effectively increase vaccination rates in challenging social contexts.

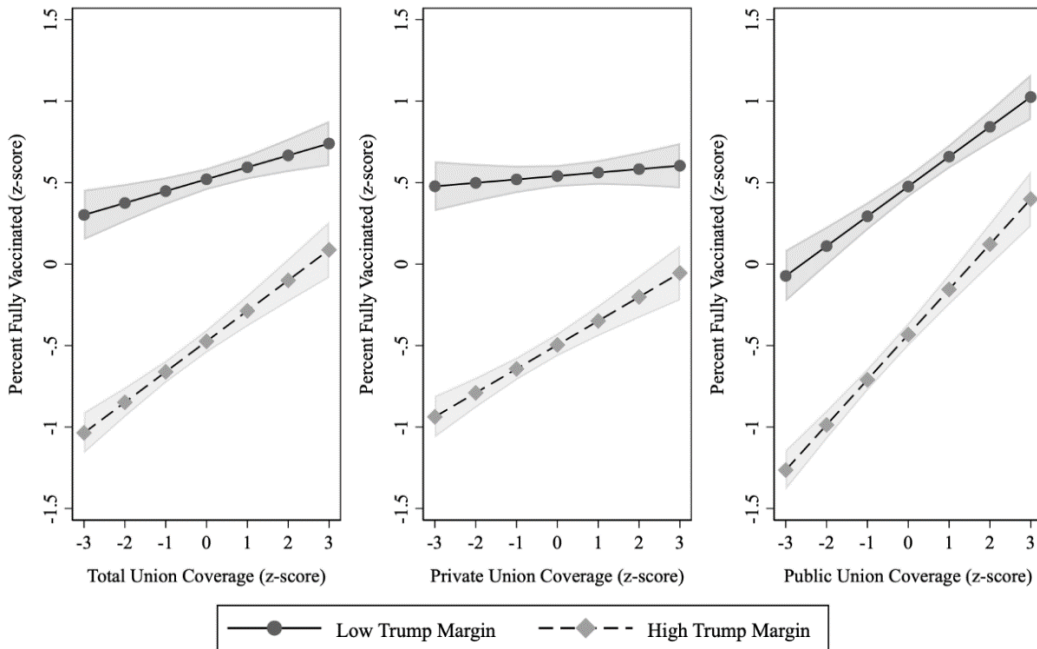
In Panel B, we display the interaction effects for union coverage and the Trump margin of victory in the same manner as in Panel A. In low-Trump-margin counties, vaccination rates are generally higher than in high-Trump-margin counties and all three union measures augment those higher rates as indicated by their upward slopes. By contrast, high-Trump-margin counties have generally lower vaccination rates, but all three measures of union coverage increase rates over what they would otherwise be. In both high- and low-Trump counties, the slope for public-sector unions is steepest. In total, the results in Figure 2 suggest that union coverage—but particularly public-sector union coverage—makes a greater difference in increasing vaccination rates in counties with higher levels of voter turnout and higher Trump margins of victory. This underscores the importance of organic solidarities in forging a collective will of the people and shaping societal outcomes.

Figure 1. Interaction Effects Predicting the Percentage of Adults Who Are Fully Vaccinated by July 4, 2021 in U.S. Counties (N=3012)

Panel A. Interactions between Union Coverage and Voter Turnout



Panel B. Interactions between Union Coverage and Trump Margin of Victory



CONCLUSION

The emergence of COVID-19 in early 2020 created significant challenges for U.S. workers, including workplace health and safety concerns during the height of the pandemic and ongoing tensions surrounding vaccination efforts. Support for unions grew significantly during the pandemic as they proved to be effective advocates for workers' health, safety, and rights. However, the politicization of the pandemic response inspired a wave of pushback against public health efforts to curtail the virus, including mask mandates, capacity limitations on businesses, and the acceptance of vaccines as the best weapon in the war against COVID. The pandemic has revealed how democracy in the workplace—in the form of unions—and democracy in the broader society can influence responses to large-scale crises such as pandemics. In sum, the ongoing tension between individual freedom and pursuit of the common good has revealed a deep democracy deficit in parts of the country. In this report, we explored several questions related to unions, democracy, politics and responses to the pandemic. We report several important findings.

First, we found that union coverage—the percent of all workers covered by a union contract—is positively and significantly related to vaccination rates at the county level. With heightened levels of workplace democracy, workers are better able to identify collective problems and articulate collective solutions. Despite media coverage of some unions opposing vaccine mandates, the empirical evidence suggests that on the whole, unions have been beneficial for vaccination efforts as counties with high levels of unionization are more highly vaccinated, net of other plausible explanations. Member-to-member organizing conversations, social media campaigns, and local vaccine clinics organized by teachers' unions, service sector unions, nurses' unions, and others helped to educate union members, their families, and the general public about the safety and

effectiveness of vaccination as a tool for curbing the virus's spread.

Second, we found that democracy and civic engagement—as represented by voter turnout—was also positively related to vaccination rates. In counties with higher voter participation rates, residents are more likely to have received a COVID-19 vaccine. Third, we found that political preference, as measured by the Trump margin of victory was strongly and negatively related to vaccination rates. This was consistently the strongest predictor of vaccination rates in our models.

Finally, when exploring the heterogeneous effects of unionization, we found that all three measures of union coverage increase vaccination rates at faster rates in counties with high voter turnout than in those with low voter turnout. We also find that all three measures of union coverage increase vaccination rates at a faster rate in counties with high margins of victory for Trump. That is, despite the dampening effect of Trump support on vaccination rates, these negative effects are mitigated to some extent in counties with strong union presence.

Taken together, the results of this study offer some insight into the COVID vaccination crisis as well as public responses to widespread crises more generally. When workers have a collective voice in their workplace and beyond, and when citizens are actively engaged in democracy, then collective action problems are more easily addressed and the pursuit of common-good solutions such as vaccination become more likely. Even when such solutions are highly politicized, the formation of a collective identity through organic solidarities at work and in the community can lead people to embrace the need for collective solutions. By connecting the interests of citizens within one important sphere of life, the workplace, to their broader interests as members of a community, unions can be a powerful vehicle for advancing democracy in society. During a pandemic, that can be the difference between life and death.

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