US Centre Summer Research Grant

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Project Title: Behavioural Incentives for Vaccine Uptake: Heterogeneity Across Individuals

Summary of Project:

In the aftermath of the COVID-19 pandemic, vaccine hesitancy emerged as a persistent challenge to achieving herd immunity, especially in the United States. We study the extent to which partisan political identity and other behavioral concepts shaped the responses to incentives for vaccination and created heterogeneity in vaccine uptake. In our first study, we use nationally representative longitudinal data from the Understanding America Study's COVID-19 Tracking Survey in 2021, and employ a difference-in-differences design to investigate how party identity shifted the effect of monetary incentives and COVID-19 vaccine uptake. We show that although monetary incentives increased vaccine uptake by 5.9 percentage points (pp), registered *Democrats in incentivized states were 4.6pp more likely to vaccinate*, while registered Republicans *exhibit a 2.8pp decrease relative to baseline*. We will dive deeper into these results in a second study focused on health insurance as a driver for vaccine decision making, and a third study based on a discrete choice experiment for other, non-COVID-19 vaccinations.

Introduction

COVID-19 has resulted in more than seven million deaths globally (WHO, 2025), a staggering toll that highlights the urgency of identifying the drivers of both effective and ineffective responses. Disentangling these drivers is central to improving preparedness and resilience in the face of future pandemics. A particularly salient dimension of this global response has been vaccine hesitancy. As vaccines became the cornerstone of pandemic exit strategies, hesitancy emerged as a critical barrier to reaching the levels of population immunity required to curb the virus. Importantly, vaccine hesitancy was not a new challenge: in 2019, before COVID-19 emerged, the World Health Organization had already listed it among the top ten threats to global health (WHO, 2019). The pandemic merely amplified its significance, casting it as a key determinant of public health outcomes. Understanding why certain populations embraced vaccination while others resisted remains a pressing question with implications that extend well beyond COVID-19 itself.

Governments worldwide attempted diverse strategies to reduce hesitancy and increase vaccine uptake, including the use of monetary incentives. Evidence suggests that such incentives can indeed be effective. For example, a randomized controlled trial in Sweden demonstrated that offering approximately US $24 increased vaccination uptake by 4.2 percentage points from a baseline of 71.6% (Campos-Mercade et al., 2021). More generally, a systematic review synthesizing 38 studies up to March 2022 concluded that while effects were often modest, incentives consistently had positive impacts on actual vaccination behavior rather than merely shifting stated intentions (Khazanov et al., 2023). Yet, the evidence is far from uniform. Some studies and reviews report null or even negative effects (Khazanov et al., 2023; Sprengholz et al., 2021). Such findings underscore that incentives cannot be understood in isolation: their effectiveness depends heavily on social context, political trust, and how they are communicated.

These nuances are particularly relevant in the United States, where the pandemic unfolded against the backdrop of intense political polarization. Existing research shows that preventive health behaviors during COVID-19—such as mask-wearing, social distancing, and even willingness to get tested—were often filtered through partisan identity (Grossman et al., 2020; Hart et al., 2020; Neville et al., 2021; Razai et al., 2021). Because the United States experienced especially politicized debates around COVID-19 vaccination, it offers a fertile context to examine how core political values intersect with behavioral interventions such as monetary incentives.

Data and Methodology

To identify if there were differences in vaccine uptake and vaccine incentive receptiveness across individuals with different political core values, this paper uses the Understanding America Study's Coronavirus Tracking Survey. This dataset contains information on individual attitudes and behaviors regarding the COVID-19 pandemic across 33 waves. Specifically, this paper's analysis is limited to waves 24 to 30 of the survey, covering the period commencing February 3rd, 2021, and terminating at the end of Wave 30's collection period on October 31st, 2021. This time period was chosen to align the analysis with the gradual release of COVID-19 vaccines to the public. COVID-19 vaccines were first approved in the US in December 2020 and were made available to the public in primarily a two-dose regime, while state-sponsored financial incentive schemes for vaccination began to be implemented varyingly by states around April and May 2021.

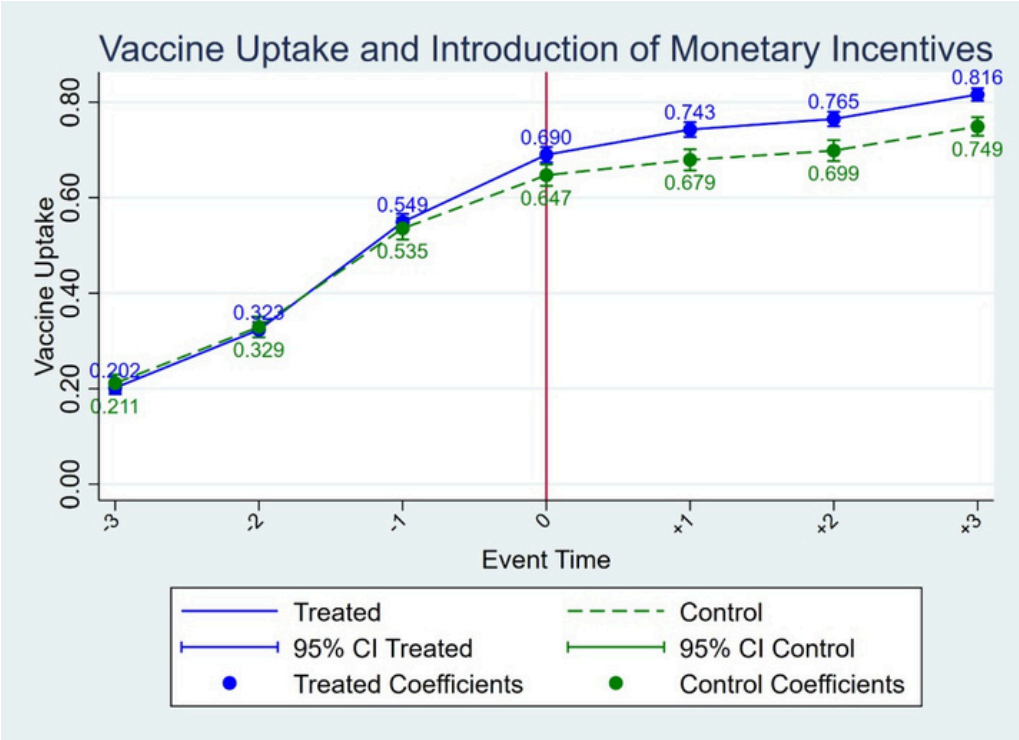
To estimate the effect of political core values on COVID-19 vaccine incentive receptiveness and uptake, this study employed a difference-in-difference approach alongside event study and two-way time and state fixed effects models, where vaccine incentives are grouped by US state. . Other robustness checks included analyzing the extensive margins of the implemented incentives, focusing on the different types of incentives being used, and verifying our results by running other econometric models to see if our estimates remain consistent. Moreover, to verify the mechanisms at play, we conducted a series of subgroup analyses based on politics, as well as a variety of heterogeneity tests.

This paper based its analysis on Hogan et al.'s (2022) comprehensive assessment of US statewide financial incentives in 2021 during the rollout of COVID-19 vaccines (Hogan et al., 2022). Drawing from this table, our analysis included the 35 US states that implemented monetary incentives of interest between April to November 2021; 23 states implemented lotteries while 12 states implemented guaranteed cash payments. Additionally, 27 of the 35 states were governed by a Democrat politician, with the remaining 7 governed by a Republican. These states are our treatment group, while our control are those states that at no point implemented financial incentives for COVID-19 vaccination.

Results

The analysis sample was composed of 6183 distinct individuals with an average age of 52, with more than half of the sample being vaccinated for COVID-19. Figure 1 shows the vaccine uptake rate of US states pre-implementation of monetary incentives, showing parallel trends between control and treatment states until the announcement and subsequent full implementation of monetary incentives, with a statistically significant jump in average vaccine uptake in states with incentives after their implementation.

Figure 1. – Average Vaccine Uptake and Monetary Incentives



Note: Coefficients plotted include confidence intervals denoted by the bracketed line. Non-intersecting brackets between treated and control coefficients signal statistical significance. Event time 0 captures Wave 27, with previous and subsequent waves denoted by -/+1 etc., covering the study period of February 3rd, 2021 to October 31, 2021.

Having satisfied the parallel trends assumption, a basic difference-in-difference model was ran setting the post treatment DID coefficient as waves greater or equal to Wave 27, the first wave with incentives fully implemented. Table 10 shows that indeed, the introduction of monetary incentives

had a statistically significant positive effect on vaccine uptake rates in the states that implemented them, resulting in a 5.9 percentage point increase in vaccine uptake across those states compared to control states that never had incentives.

Table 1 – DiD Model on Effect of Monetary Incentives on COVID-19 Vaccine Uptake

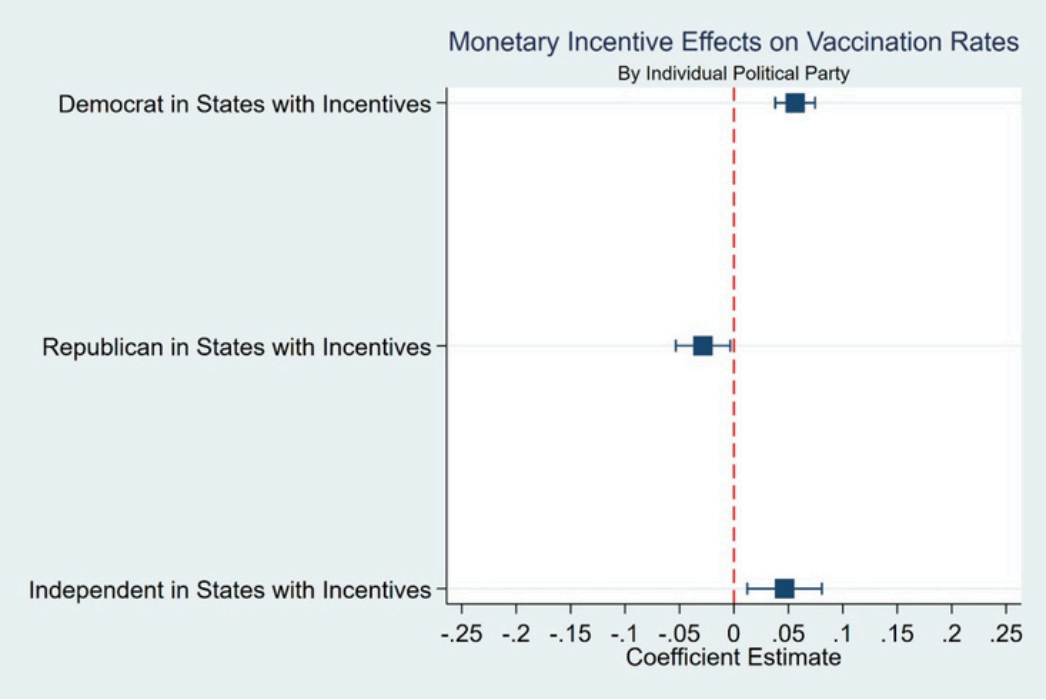
VARIABLES	(1) COVID Vaccine Uptake	(2) COVID Vaccine Uptake
SMonetary Incentives	0.000238	0.00822
	(0.0145)	(0.0127)
POST	0.340***	0.337***
	(0.00935)	(0.00949)
SMonetary Incentives x POST	0.0594***	0.0595***
	(0.0200)	(0.0200)
Controls	NO	YES
Constant	0.355***	-0.132***
	(0.0134)	(0.0406)
Observations	34,973	34,973
R-squared	0.145	0.226

Note: This table presents the estimates of the primary difference in difference interaction term, showing a highly statistically significant positive effect on vaccine uptake in states after the implementation of monetary incentives. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Figure 2 presents the main findings of the difference-in-difference model with state and time fixed effects, where we now interact the treatment variable with individuals' political party registration.

Overall, states with monetary incentives saw a statistically significant 4.6 pp increase in vaccine uptake for Democrat-registered individuals, compared to Democrats in states without incentives. However, these states also saw a significant -2.8 pp decrease in vaccine uptake for Republicans compared to Democrats in states without incentives; with the mean of vaccine uptake in our entire sample being .56, Republicans in incentive states were -5pp less likely to vaccinate compared to the mean. Independent individuals fell in the middle of the two parties, with a significant 2.9 pp increase.

Figure 2. - DiD with TWFE Model – All Incentivized States with Party Registration

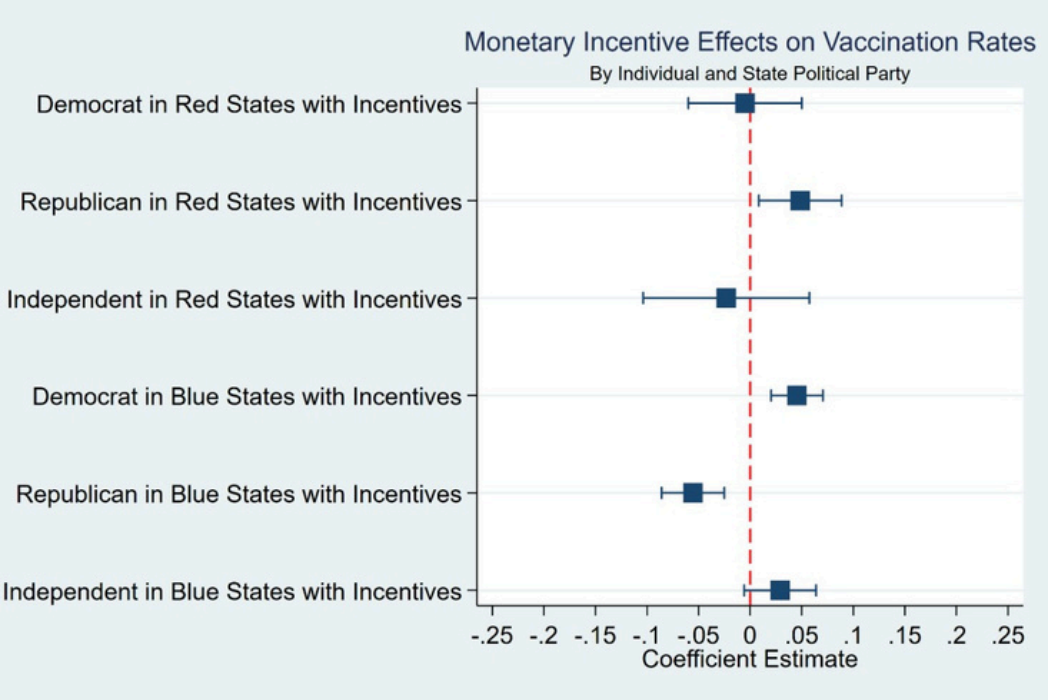


Note: Lincom coefficients plotted are to be interpreted in relation to the reference category, Democrats in States without Incentives. The red dotted line denotes the null hypothesis of there being no effect of incentives.

Figure 3 presents the results of the same analysis, now considering the political affiliation of the state in which an incentive was implemented, according to the political party of each state's governor: Blue for Democrat-governed states, Red for Republican-governed states. In states with Democrat governors that implemented monetary incentives: the gap in vaccination widened for

Republicans, who had a significant -5.7pp decrease in vaccine uptake compared to Democrats in states without incentives. A significant 4.8pp increase for Democrats in incentivized states compared to non-incentivized Democrats was also observed, while Independents had a non-statistically significant comparative 3.2pp increase. Instead, Republican-governed states with incentives saw vaccine uptake for Republican-registered individuals rise, with a significant 4.2 pp increase compared to Democrats in control states. Independent individuals had a non-significant -1.1 pp comparative decrease in uptake; there were no changes for Democrats.

Figure 3. - DiD with TWFE Model – Party Registration in Red vs Blue Incentivized States



Note: The treatment effects are within-state-type comparisons, and come from two separate subgroup regressions for Republican- and Democrat-governed states. Lincom coefficients plotted are to be interpreted in relation to the reference category, Democrats in States without Incentives. The red dotted line denotes the null hypothesis of there being no effect of incentives.

Conclusion

We show that although monetary incentives increased vaccine uptake, registered Democrats in incentivized states were more likely to vaccinate, while registered Republicans exhibit decrease relative to baseline. When considering state leadership, we find that registered Republican individuals in GOP-governed states saw an increase, whereas Republicans in Democrat-governed states had a decrease in vaccination. These results suggest that partisan signals boost compliance when aligned with group political identity but backfire otherwise.

From a policy perspective, these findings underscore that incentives are not politically neutral tools. Their success depends on how they are perceived within partisan frameworks of trust and identity. This has implications not only for U.S. public health strategy but also for any polarized society where vaccine skepticism or broader health hesitancy intersects with partisan cleavages. Policymakers must carefully consider who communicates incentives and how they are framed to avoid unintended backlash.

Next Steps

Findings from the first study of this thesis confirm that there indeed is a partisan divide in COVID-19 vaccine uptake. The second upcoming paper of this thesis utilizes the same dataset to investigate the role of the US's Medicaid expansion during the pandemic in mediating COVID vaccine uptake. However, this thesis is focused on vaccination behaviours, and to a more general extent, the social and political formation of preferences for healthcare. Indeed, in the post-COVID United States, all types of vaccines are now the subject of an unprecedent misinformation-driven erosion of confidence, reflected in the resurgence of measles, and in the waning rates of childhood vaccination (CDC, 2025; Williams et al., 2025).

For this reason, we will conduct our own discrete choice experiment (DCE) survey to explore drivers of vaccine hesitant behaviours in US participants for non-COVID-19 vaccines, such as measles, as well as other relevant pharmaceuticals such as Ozempic. We are in the process of designing this DCE questionnaire with the input of relevant experts in preventive healthcare, so as to capture important attributes to consider in our experiment. Moreover, we have already come to an agreement with market research company Demetra Opinioni to have them circulate our survey

for data collection. Participants will be recruited in the USA, and age, gender, ethnicity, and income will be considered so that the sample is nationally representative. Setting up our study this way will be of great benefit to the thesis as a whole: it will provide complete control over the specific questions respondents are asked , as well as the opportunity to recruit specific groups of individuals should we identify a population of particular interest (ex. more measles vaccine-hesitant individuals) following attribute setting and literature reviews. This study methodology allows us to support and zoom into the findings of our previous two studies in more detail, so that we can paint a more cohesive picture to help answer the overarching question of vaccine hesitancy heterogeneity, and contextually identify what kind of incentives may be more effective to address this.

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