Cable News and COVID-19 Vaccine Compliance

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Abstract

COVID-19 vaccines have already reduced infections and hospitalizations across the globe, yet resistance to vaccination remains strong. This paper investigates the role of cable television news in vaccine skepticism and associated local vaccination rates in the United States. We find that, in the later stages of the vaccine roll-out (starting May 2021), higher local viewership of Fox News Channel has been associated with lower local vaccination rates. We can verify that this association is causal using exogenous geographical variation in the channel lineup. The effect is driven by younger individuals (under 65 years of age), for whom COVID-19 has a low mortality risk. Consistent with changes in beliefs about the effectiveness of the vaccine as a mechanism, we find that Fox News increased reported vaccine hesitancy in local survey responses. We can rule out that the effect is due to differences in partisanship, to local health policies, or to local COVID-19 infections or death rates. The other two major television networks, CNN and MSNBC, have no effect, indicating that messaging matters and that the observed effect on vaccinations is not due the consumption of cable news in general. We also show that there is no historical effect of Fox News on flu vaccination rates, suggesting that the effect is COVID-19-specific and not driven by general skepticism toward vaccines.

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1. Introduction

Since their introduction in late 2020, COVID-19 vaccines have bolstered the fight against the disease, substantially reducing the likelihood of infection and especially severe cases (Amit et al., 2021; Dagan et al., 2021; Polack et al., 2020; Voysey et al., 2021). Given their proven effectiveness and the continued social costs of infection, the persistent resistance toward vaccination poses an urgent policy problem. Correspondingly, understanding the determinants of decisions to comply with or resist vaccines poses an urgent scientific question.

There is a small and timely literature providing some initial findings on this question. Exposure to online misinformation is associated with a decline in the willingness to take a COVID-19 vaccine (Loomba et al., 2021; Roozenbeek et al., 2020). Individuals who are opposed to the vaccine are less likely to obtain information about the pandemic from traditional and authoritative sources (Murphy et al., 2021).

We add to this research by exploring the role of television news providers in vaccine decisions. In the context of the COVID-19 pandemic, previous work has shown that conservative media consumption is associated with less social distancing (Ash et al., 2020; Gollwitzer et al., 2020; Simonov et al., 2020) and worse COVID-19 health outcomes (Bursztyn et al., 2020).[1] Because news providers vary in their skepticism toward COVID-19 vaccination,[2] differential exposure to those providers might influence reported vaccine hesitancy and observed vaccine compliance. In particular, Fox News Channel's prime time show Tucker Carlson[3] has taken a strong stance against vaccines, misleadingly representing deaths following a vaccination to be caused by it (Barr, 2021; Stelter, 2021).

Our empirical approach pairs data on county-level vaccination rates with data on viewership of the main cable news providers: Fox News Channel (FNC), MSNBC, and CNN. In the early months of the vaccination campaign, there is no relationship between cable channel viewership and vaccine compliance. However, in the most recent months starting in May 2021, Fox News viewership is negatively related to vaccine compliance. In this recent period, there is still no observed association between vaccination rates and viewership of the other cable news networks MSNBC and CNN.

We can show that the relationship between FNC viewership and lower vaccination compliance is causal using a natural experiment. The networks' channel position in the lineup provides an exogenous instrument for viewership, as widely used in economics and political science (Ananyev et al., 2021; Ash et al., 2021; Galletta and Ash, 2019; Martin and Yurukoglu, 2017; Simonov et al., 2020). Leveraging the exogenous variation in viewership, we estimate a local average treatment effect and find qualitatively coherent results. Exogenously higher FNC viewership due to channel position causes lower vaccine compliance.

The rest of the paper provides a number of supporting results to understand the most relevant mechanisms. Overall, the results support the interpretation that FNC promulgated a uniquely skeptical narrative about vaccines. That narrative caught on and reduced compliance among the marginal vaccine recipient.

First, we look at the effect of cable news viewership on responses to a national survey, which asked respondents about their hesitancy to take the vaccine. In areas with higher FNC viewership, there was higher reported hesitancy to vaccinate. Thus we can provide support for a behavioral mechanism, where FNC's skeptical vaccine narrative affects vaccination rates by changing attitudes and intentions regarding the vaccine.

Second, we consider whether the effects are driven by local healthcare capacity. If the difference in vaccination rates

[1] The papers on COVID-19 are part of a broader literature on the effects of media news reporting on individual preferences and behavior (DellaVigna and La Ferrara, 2015), political elections (Ash et al., 2021; DellaVigna and Kaplan, 2007; Hopkins and Ladd, 2014; Martin and Yurukoglu, 2017), and local fiscal policies (Galletta and Ash, 2019).

[2] Fox News had skeptical views on the risks posed by the Coronavirus at early stages of the pandemic (Ash et al., 2020; Abutaleb et al., 2020; Badger and Quealy, 2020; Peters and Grynbaum, 2020) and has generally been doubtful on scientific research and experts (Feldman et al., 2012; Huertas and Kriegsman, 2014; Hmielowski et al., 2014).

[3] One of the most popular prime time shows on FNC (Barr, 2021; Stelter, 2021).

were due to healthcare capacity, we would see a similar effect in the early as well as later stages of the vaccination campaign. Yet we find there was no effect on vaccine compliance in the early months, and even in the most recent period there is no effect on older individuals (65+). Thus the effect of cable news is focused among relatively low-risk individuals, supporting a behavioral response, and helping to rule out an effect due to local healthcare capacity. Further supporting this idea, we find there is no effect of FNC on measurements of local healthcare capacity, including number of ICU beds and number of hospitals. We also rule out that the difference in compliance is due to differences in infections or deaths.

Third, we look at partisan affiliation or political ideology as vehicles for differences in beliefs and attitudes about vaccines. It could be that Republicans or conservatives are overall more skeptical of the COVID-19 vaccine, and that the effect of FNC works by increasing the number of Republicans or number of conservatives. Our results show that this is unlikely to be the case, as the effect of FNC on vaccine compliance holds even when controlling for partisan affiliation and political ideology.

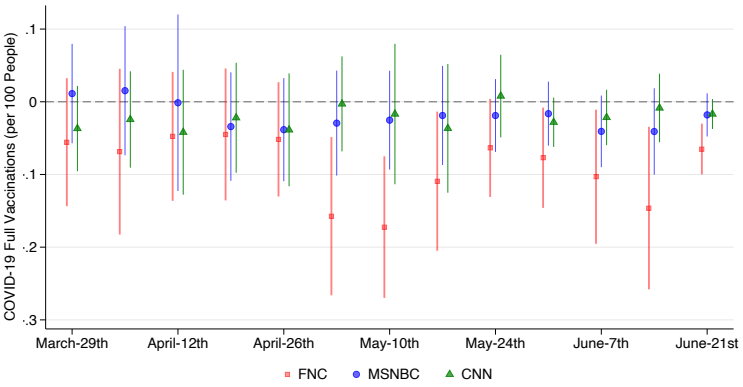
Finally, we consider whether FNC has affected general attitudes towards vaccines, for example through anti-science rhetoric. To check this, we look at the effects on seasonal flu vaccines. There is no effect, suggesting that there is no generic anti-vaccine effect and that the effect on COVID-19 vaccines is due to a COVID-specific narrative.

These findings provide timely insights on the COVID-19 vaccine deployment in the United States. The main cable news television providers are affecting vaccination decisions. Future efforts by government agencies and health organizations to encourage vaccine compliance should account for how media narratives may strengthen or weaken those efforts.

2. Main Results

Figure 1 shows the association between the viewership of the three major U.S. television networks (FNC, MSNBC, CNN) and the number of people receiving their final COVID-19 vaccination dose[4] within the given week[5]. We obtain those coefficients by running cross-sectional regressions at the county level with 95% confidence intervals. While we do not observe a statistically significant effect associated with CNN and MSNBC viewership, counties with higher Fox News viewership exhibit a lower percentage of the population getting the vaccine, starting the first week of May.

Figure 1: Cable news viewership and weekly vaccination rates



Notes: Coefficient plots with 95% CIs from OLS regressions looking at the association between one standard deviation changes in viewership on weekly vaccinations per 100 people. Regressions include demographic and cable-system controls. Standard errors are clustered by state.

These estimates may have endogeneity issues, as pre-existing ideologies within counties are likely to be correlated with viewership. Exploiting the fact that casual viewers surfing through channels tend to spend more time watching programs with lower channel numbers[6] and that these positions in the cable system lineup are exogenously determined, we get around the endogeneity problem by using an instrumental variables approach. We estimate Two-Stage Least-Squares (2SLS) regressions, instrumenting the endogenous viewership with the networks' channel position (for details, see Section 1).

Results from the 2SLS analysis (cf. Figure 2) are quali-

[4] First dose for single-shot vaccines, second dose for two-shot vaccines. We do not have information on the vaccine producer.

[5] We assign the weekly data to Mondays. We provide in Fig. S.9 estimates since January, because of smaller sample size.

[6] This group defines the compliers for the estimated local average treatment effect (LATE).

tatively coherent with the OLS estimates. Starting May 2021, counties with higher Fox News viewership report lower vaccination rates, with a one standard deviation increase in viewership being associated to roughly 1.5 to 3.2 less vaccinations per 100 people.[7] The effect seems to fade out at the end of June. For MSNBC and CNN, we find a mostly positive effect, though not statistically significant.[8] Put in perspective, these results imply that watching one additional hour of Fox News per week for the average household (a 30% increase above the mean viewership) reduces the number of vaccinations by 0.35 to 0.76 per 100 people for the period in which we observe a significant effect.

In the estimation for each network's effect, our preferred specification accounts for the other networks' relative channel position and ratings as well as for geographical confounders by using state fixed effects. We weight by the 2010 Census populations, cluster standard errors at the state level and control for counties' socio-demographic characteristics and political preferences.[9]

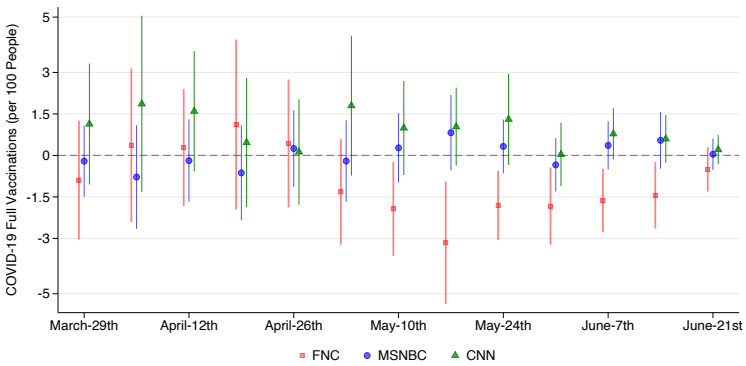
3. Analysis of Mechanisms

Looking separately at the effect of the networks on vaccinations by age, we observe that results are driven by the share of the population aged 18 to 65 years, with no significant effect on the group older than 65 years (Figure 3). It is important to note that, even though the population above age 65 was allowed to get vaccinated starting end of January, roughly 20% of that group took the vaccine in the period of analysis, with still 40% not yet vaccinated.

We explore four possible mechanisms behind the behavioral effects that we observe. First, to further investigate the timing of the Fox News effect, we use county-level survey data provided by the Centers for Disease Control and Prevention (CDC) on hesitancy about COVID-19 vaccinations for the first half of March 2021. We find that, in areas with higher Fox News viewership, subjects report a higher hesitancy to take the vaccine (Table 1). Together, these results are consistent with the hypothesis that media coverage has reduced vaccinations by discouraging the share of the population with low health-related risks from getting vaccinated.

Second, we look at the the health care system and the COVID-19 situation of the counties. It could be that the areas that have, for example, higher Fox News viewership, systematically differ in terms of the health care system's capability to handle a COVID-19 outbreak, for example due to effects on local government funding (Galletta and Ash, 2019), or that these counties suffered more severe numbers of cases and deaths in 2020 or the period before the vaccination dates. To investigate this possible mechanism we run 2SLS regressions on the estimated COVID-19-specific risk of the counties and the availability of intensive care units (ICU) and hospitals. We

Figure 2: Effect of network viewership on weekly vaccination rates (2SLS)



Notes: Coefficient plots with 95% CIs from 2SLS regressions of the effect of one standard deviation changes in viewership on weekly vaccinations per 100 people. Viewerships are instrumented using the lineup channel positions. Regressions include demographic and cable-system controls. Standard errors are clustered by state. First-stage F-statistics: 13.85 (FNC), 4.45 (MSNBC) and 2.53 (CNN).

[7] One standard deviation is equal to 2.34 rating points, roughly corresponding to 252 minutes of weekly viewership for the average household

[8] With the caveat of a weak first stage for the CNN and MSNBC models.

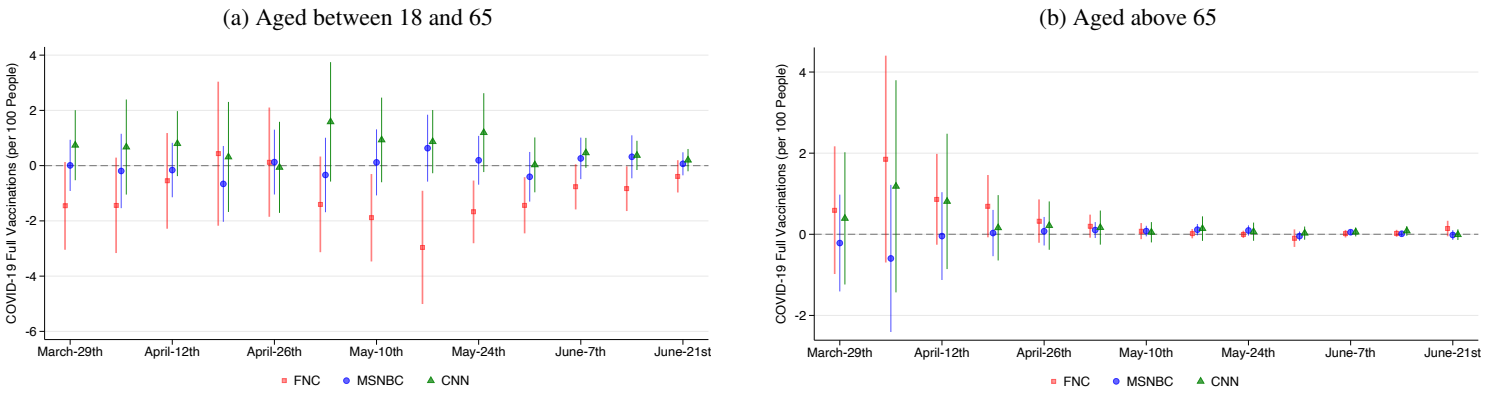
[9] Results are robust to a wide range of checks including a smaller/greater set of demographic and U.S. presidential election controls, variations in the instrumentation of the viewership, specification and sample checks and controlling for COVID-19 related characteristics of the county as cases and deaths, ability to handle an outbreak and surveyed COVID-19 vaccine hesitancy. Check Section 1 and the Supplementary Materials for further details.

Table 1: Further outcome measures - 2SLS

	Vacc. Hesitancy	Outbreak Concern	ICU Beds (#)	Hospitals (#)	2016 Flu Vacc. (%)	2017 Flu Vacc. (%)	2018 Flu Vacc. (%)
FNC	0.04^{+}	0.01	490	26	-0.58	-0.45	-0.05
(s.e.)	(0.02)	(0.10)	(1135)	(41)	(7.46)	(7.98)	(8.47)

Notes: Two Stages Least Squares estimates of the effect of each network's viewership on further outcome measures. Viewerships are instrumented using the lineup channel positions. Regressions include demographic and cable-system controls. Standard errors are clustered by state. Estimates are relative to a one s.d. increase in the network's viewership. $^{+}$ $p < 0.10$, * $p < 0.05$, and ** $p < 0.01$.

Figure 3: Effect of networks viewership by age (2SLS)



Notes: Coefficient plots with 95% CIs from 2SLS regressions showing the effect of one standard deviation changes in viewership on weekly vaccinations per 100 people, by age group. Viewerships are instrumented using the lineup channel positions. Regressions include demographic and cable-system controls. Standard errors are clustered by state.

observe no significant effects from any of the networks.[10] We replicate our main specification analysis including those measures as controls (Figure S.17). Furthermore, our main results are robust to additional controls accounting for the number of COVID-19 cases and deaths one month before the vaccination date or to the overall cumulative cases and deaths or their interaction with the instruments (Figures S.15-S.16).

Third, Fox News viewership has been shown to be correlated with voting Republican (Ash et al., 2021; DellaVigna and Kaplan, 2007; Martin and Yurukoglu, 2017) and other networks' viewership might be associated with more anti-vaccination left-wing politics. Following Ash et al. (2020), we show that partisanship is unlikely to be the driver of our results. Our estimates are unaffected when we control for the pre-treatment Republican vote share in 1992 and 1996 (Figure S.10) or their interaction with the instruments (Figure S.11). In line with that, we are including controls for the pre-pandemic Republican vote share in the 2012 and 2016 elections in our main specification. Our results are furthermore robust to adding self-reported political ideology, partisanship (Figure S.12), and their interactions (Figure S.13) from the Gallup survey as controls.

The fourth mechanism we explore is anti-science rhetoric. Fox News Channel has been linked to anti-science beliefs (Feldman et al., 2012; Hmielowski et al., 2014; Huertas and Kriegsman, 2014) and this long-run effect of the network's viewership might have affected the compliers' predisposition to vaccinations. Using seasonal flu vaccination data for the sample of Medicare fee-for-service enrollees for the years

[10]The three measures come from the U.S. CDC and from Kaiser Health News (KHN). The county COVID-19 risk is estimated by the CDC using information on e.g. health care, housing, and transportation (Tables 1 and S.5). See SM S.1 for more info.

2017 to 2019[11], we find no significant effect of the networks' viewership on the percentage of people vaccinated (Tables 1 and S.5). We are not fully able to disentangle the effect of these beliefs from the COVID-19 vaccine coverage, because of the limited over-time variation in our channel position instrument. However, if the anti-science rhetoric was the strongest driver of vaccine skepticism, we would expect to see an effect of conservative or liberal media on other vaccination rates.

Overall, the evidence is consistent with FNC having a skeptical narrative, specific to COVID-19, which persuaded marginal vaccine recipients not to take the vaccine. Fox News expressed skeptical views on the risks posed by the Coronavirus at early stages of the pandemic, for example by downplaying the disease as a "normal flu", ridiculing the "flu panic" and claiming it to be used as "political weapon" against President Trump (Ash et al., 2020). Its shows have also been undermining the COVID-19 vaccines (Barr, 2021; Stelter, 2021), for example labeling them as dangerous, or calling out lobbying by "Big Pharma" (Figure S.7). Our results, in addition to the previous literature on slanted media and behavioral responses to the pandemic, suggest that the COVID-19 coverage of Fox News is at least partially responsible in reducing participation in vaccination efforts, likely in addition to the effect of the persistent anti-science slant.

4. Conclusions

Our results show that Fox News is reducing COVID-19 vaccination compliance in the United States, with no evidence of the other major networks having any effect. We first show that there is an association between areas with higher Fox News viewership and lower vaccinations, then provide an instrumental variable analysis to account for endogeneity, and help pin down the magnitude of the local average treatment effect. Supporting analysis suggests that slanted media rhetoric is linked to vaccination hesitancy, producing significant behavioral effects in the share of the population that is younger than 65 years with low health risks.

Overall, an additional weekly hour of Fox News viewership for the average household accounts for a reduction of 0.35 to 0.76 weekly full vaccinations per 100 people during May and June 2021. This result is not only driven by Fox New's conservative and anti-science messaging, but also by the network's skeptic coverage of COVID-19 vaccinations. We will continue to update our estimates in the next weeks as more data become available.

5. Materials and Methods

This section provides a more detailed description of the data and methods used in the paper.[12]

Data Sources. Data on vaccinations, the main focus of analysis, are provided by Centers for Disease Control and Prevention (CDC). Data are available for roughly 2750 counties from 47 states, for the main period of analysis. Pivotal for our empirical strategy are data on the U.S. Broadcast media provided by Nielsen. We use channel lineup positions for FNC, MSNBC and CNN from 2016, the latest year of data availability. Viewership is expressed in ratings, the number of minutes that each household tuned in to each specific channel during the months of January and February 2020. Throughout the analysis we use demographics from the 2010 U.S. Census and data on political attitudes from the U.S. presidential elections.

While investigating the mechanism behind the observed effects and their robustness, we use several other data sources. For political party self-identification and ideology from 2012 to 2020, we use data from the Gallup Polling Social Series. Moreover, we also look at overall television viewership measures using the American Time Use Survey for the period 2010-2019. To account for locality differences in the health care system and the COVID-19 situation, we use data from

[11] Such data are offered by the County Health Rankings & Roadmaps program from the University of Wisconsin.

[12] More detailed information are available in the Supplementary Materials.

KHN on the number of ICU units and Hospitals and data from the New York Times for COVID-19 cases and deaths. We use survey measures of hesitancy towards the COVID-19 vaccine and data on the counties' ability to handle a COVID-19 outbreak from the CDC for March 2021. Flu vaccination data based on Medicare fee-for-service enrollees for the years 2017 to 2019 come from the County Health Rankings & Roadmaps program of the University of Wisconsin.

Association between networks' viewership and COVID-19 vaccinations. In Figure 1, we look at the county-level association between FNC, MSNBC and CNN viewership and the weekly number of vaccinations per 100 people. Our estimation approach consists of a series of cross-sectional regressions run separately for each week. We use state fixed effects to account for time-invariant characteristics at the state level, weight by county population and include county-level socio-demographic characteristics for population density, land area, working-age, eligibility for food stamps, sex, Black, white, and below high-school-educated or college-educated. Standard errors are clustered at the state level. For each network, we control for the other two networks' viewership and their relative channel position (defined as the difference between each other network and the network of interest).[13]

Causal effect of networks' viewership on COVID-19 vaccinations. In order to investigate the causal effect of viewership, we employ an instrumental variable approach first proposed by Martin and Yurukoglu (2017), using the network's channel position in the cable system lineup as an instrument for viewership. Our analysis follows closely the one from Ash et al. (2020), who study the effect of Fox News on mobility during COVID-19. We expand the focus of the research by looking into two other major networks in detail: CNN and MSNBC. To better assess the relative effect of each network, we make use in the analysis of the relative channel position between the networks in a similar fashion as Galletta and Ash (2019).

First, we take the channel position of the network with the highest viewership (FNC) as a reference point, and calculate the relative position by subtracting it from the channel position of CNN and MSNBC. We translate this into a Two-Stage Least-Squares estimation, by predicting the viewership of the reference network FNC with its channel position, controlling for its relative position to the other networks, and instrumenting the viewership of CNN and MSNBC with the position relative to both other networks.

Using the relative channel position in the instrumentation allows us to partially improve the weak first stage prediction of viewership for CNN and MSNBC, a problem encountered in previous works (Martin and Yurukoglu, 2017; Ash et al., 2021), that also represents a caveat to our analysis. For completeness, we report our main results using the standard estimation strategy from Martin and Yurukoglu (2017) in Figure S.6. Results are virtually identical for FNC and CNN, while the MSNBC model becomes noisy.

The 2SLS estimation follows the same specification as the OLS estimation.[14] We check then for instrumental relevance, i.e. that the channel position predicts viewership. Figure S.3 shows the negative correlation between channel positions and viewership, while Table S.2 shows the first stage for our instrumentation employing the relative channel position of the networks. We run, finally, a series of tests to verify if our instruments are exogenous to a range of predetermined county characteristics that could be correlated with vaccinations. These regressions (Table S.3), suggest that the instrument is indeed exogenous to such characteristics.

Robustness checks. We present a wide set of robustness checks to support our analysis.

First, we show that our specification is robust to various changes in the set of controls and that estimates are not driven by specific outlier states (Figures S.24-S.25).

Second, we run checks on the unbalanced characteristics

[13] Results are robust to exclusion of these controls.

[14] This specification is used also to investigate the additional outcomes reported in Table 1.

and see that our results are robust to adding polynomials of these variables or interacting them with the instruments (Figures S.4-S.5).

Third, we replicate our main results by adding as controls, or interacting with the instrument, the relative share of Republican votes in the U.S. presidential elections from 1992 and 1996 (Figures S.10-S.11). To further support the fact that our results are not driven by partisanship, we use data on self-reported party affiliation and ideology from the Gallup Polling Social Series and show that our results are robust to their inclusion as controls or as interactions with the instrument.

We additionally replicate Ash et al. (2020) using data on TV viewership from the American Time Use Survey. From that analysis, we find that networks don't have an effect on total hours of TV watched (Figure S.14) and that our estimates do not vary with its inclusion as control.

Finally, we show that the effect on vaccinations is not driven by the recent number of COVID-19 cases or the overall number of cumulative cases and deaths (Figures S.15-S.16).

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Supplementary Materials

Contents

S.1. Further information on data sources

This appendix section provides additional information about our data. Summary statistics are reported in Table S.1.

S.1.1. ***Channel positions***

Channel positions for FNC, MSNBC and CNN come from the Nielsen FOCUS database, which reports channel lineups of all U.S. local broadcast systems, with information about the area served by the system at the zipcode level. We use channel positions from 2016, the latest year for which we have access. We aggregate the data at the county level, by averaging zipcode-level channel positions with weighting by population size. To address the presence of outlier channels, we winsorize the variables at the top and bottom deciles.

S.1.2. ***Channel viewership***

Television viewership by county of FNC, MSNBC and CNN, is provided by Nielsen. The measure is"ratings," which is proportional to the number of minutes that each household tuned in to each specific channel during the months of January and February 2020. We standardize the viewership throughout the paper by its standard deviation for all networks. Some counties in the raw data were split in parts (e.g. North County-A, East County-A), and were aggregated together by simple average.

S.1.3. ***COVID-19 cases and fatalities***

Confirmed COVID-19 cases and fatalities are from the The New York Times[15]. The dataset is already at the daily and county level and starts in January 2020. As these variables are expressed in a cumulative manner, therefore we generate new daily cases and fatalities by subtracting observations of day $n-1$ from day n.

We further calculate weekly estimates by summing over daily estimates by calendar weeks. The New York Times states that cumulative cases can sometimes decrease after a state corrects a mistake in reporting. When we observe such a correction, we set weekly observations to missing if the weekly sum of daily observations is negative, too.

S.1.4. ***COVID-19 vaccinations***

The COVID-19 vaccine roll out in the United States began in December 2020, following federal guidelines and CDC recommendations[16]: First, healthcare workers were vaccinated (starting December 2020), then people aged over 65 (end of January 2021), people with medical conditions and disabilities (mid of March 2021), and people aged above 50 (April 2021). This was finally followed by an expansion of eligibility to virtually the whole population by May 2021.[17] Some states even started to distribute the vaccine to all adults in late March (e.g. Alaska, Georgia, Mississippi, Ohio, and Texas).

The statistics on full COVID-19 vaccinations (final doses) come from the Centers for Disease Control and Prevention (CDC), who aggregate data reported by state health agencies, jurisdictions and federal entities. The CDC data contain county-level numbers for most U.S. states and territories. Statistics for Texas and Hawaii are only reported at the state level – we thus do not include those states in our analysis. Also, California does not report data on counties with fewer than 20,000 inhabitants, so

[15] https://github.com/nytimes/covid-19-data

[16] State governments had the possibility to adjust the vaccination strategy depending on their demographic, health care system, and COVID-19 situation.

[17] https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations-process.html

we cannot include those counties in our analysis. Taken together, the vaccination data include roughly 2950 counties, of which around 2750 are used for the main analysis.[18].

Data access is possible via CDC's dedicated API. We collect information for the first of January 2021 and onwards. Similarly to the COVID-19 case and fatality numbers, vaccination data is provided in a cumulative manner. Generating Monday-to-Sunday weekly vaccinations, we end up with weekly data starting January 11.

Vaccination estimates refer to full vaccinations, which generally comprise two doses spaced by 4 to 5 weeks unless only one dose is required (e.g. J&J/Janssen vaccine). The CDC neither account for the timing between the two doses, nor for the delay after which the vaccine becomes effective. Note that counties refer to the individual's county of residence, not the county where they got vaccinated. Data is available for the total population, for adults aged between 18 and 64 years old, and for adults aged 65 or older.

S.1.5. ***COVID-19 vaccination hesitancy***

Vaccination hesitancy data originate from the Census Bureau's Household Pulse Survey (HPS) conducted in the first half of March 2021. In the survey, respondents were asked to answer to "Once a vaccine to prevent COVID-19 is available to you, would you ... get a vaccine?" with: (1) "definitely get a vaccine", (2) "probably get a vaccine", (3) "probably not get a vaccine", (4) "definitely not get a vaccine."

The CDC use the HPS to estimate hesitancy rates at the state level, followed by an estimation at the Public Use Microdata Areas (PUMA) level using the Census Bureau's 2019 American Community Suvery 1-year Public Use Microdata Sample. Then, county estimates are generated using the Missouri Census Data Center PUMA-to-county crosswalk. For PUMAs overlapping with multiple counties, data is averaged using the 2010 Census populations. This data, we retrieved from the CDC's website data.cdc.gov.

S.1.6. ***Heath care data***

Data on ICU units and the number of hospitals for 2438 counties are provided by Kaiser Health News (KHN). Bed counts stem from the hospitals' financial cost reports, filed annually to the Centers for Medicare & Medicaid Services[19].

S.1.7. ***Data on the counties' ability to adequately react to COVID-19***

The CDC report a variable measuring the counties' ability to handle a COVID-19 outbreak, ranging from 0 to 1 with 1 being the most vulnerable. Data originates from the Surgo COVID-19 Vaccine Coverage Index (CVAC), which is based on measures for access to health care, affordable housing, transportation, childcare, and safe and secure employment to predict how well counties can handle a COVID-19 outbreak.

S.1.8. ***Seasonal flu vaccination***

To our knowledge, there is no county level dataset on seasonal flu vaccination that covers all individuals in the United States. We use flu vaccination rates among Medicare fee-for-service enrollees, provided by the County Health Rankings & Roadmaps program from the University of Wisconsin. They take data from the CMS Office of Minority Health's Mapping Medicare

[18]This difference is due to a lack of data on viewership, for example for the states/territories of Alaska, Guam, Puerto Rico, and the Virgin Islands

[19]For more information on their methodology and data sources check:
https://khn.org/news/as-coronavirus-spreads-widely-millions-of-older-americans-live-in-counties-with-no-icu-beds/

Disparities (MMD) data tool that reports various health outcomes at the county level. The influenza vaccination prevalence rates are calculated by searching for the respective diagnosis code in Medicare beneficiaries' claims and dividing the sum by all Medicare beneficiaries in counties. Other recent papers also use this data source in the COVID-19 context (e.g. Bourassa et al. (2020)).

We take county level data for all 50 states from the 2019, 2020 and 2021 reports, each containing estimates for the year three years before the report date. Therefore, in our analysis we can integrate the flu vaccination rates of fee-for-service enrollees for the years 2016, 2017 and 2018. We understand that this data is a sub-sample of the U.S. population that have access to Medicare. In 2019, 58 million Americans were covered by Medicare, which represents health coverage benefits for most adults aged 65 and older[20].

S.1.9. ***Demographics and politics***

Other local socio-economic variables come from the 2010 U.S. Census. These variables are all at the county level and include, following the specification in Ash et al. (2020): *population*, *population density*, *land area*, *working-age share* of population aged 20-69 over other ages, proportion eligible for *food stamps*, proportion who never attended *no high school*, proportion who attended *college*, a dummy for an above-median *Black population share*, a dummy for an above-median *white population share*, and the proportion of *males*.

We also use data on the *Republican vote share* of the 2012 and 2016 presidential elections. We further expand this set of controls in the robustness check by furthermore including from the 2010 U.S. Census: proportion who attended *high school*, a dummy for above-median *Hispanic population share*, a dummy for above-median *Asian population share*, proportion belonging to *middle income categories* (20-25k, 25-30k, 30-35k, 35-40k, 40-45k, 45-50k), proportion working in *occupation categories* (management and professional, services, sales and office, construction, extraction and maintenance, production, transportation and material moving). In the supplementary materials robustness checks, we complement the Census variables with further occupation shares from the 2019 American Community Survey (ACS), which are also provided by the Census Bureau. The ACS occupation shares comprise the medical, retail, agriculture, industrial, and transport sectors.

[20] Census Bureau, Health Insurance Coverage in the United States: 2019, issued September 2020.

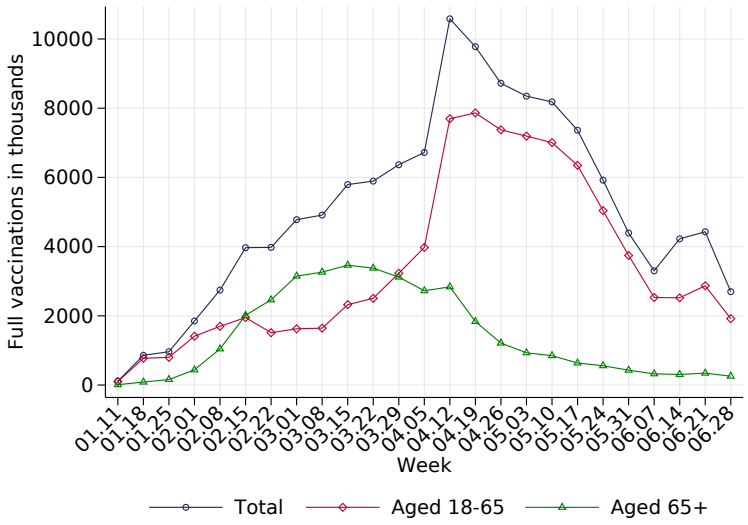
S.2. Summary statistics

S.2.1. ***Weekly evolution of COVID-19 in the U.S.***

In Figure S.1, we report weekly full vaccinations per age group in our sample of counties, and the average percentage of fully vaccinated individuals by age group. Vaccination efforts began in mid-December 2020 for the elderly and healthcare workers. We observe a sharp increase in full vaccinations for the week of April 12th, one month after several states began to open vaccination to all adults. Figure S.2 reports the number of COVID-19 confirmed cases and fatalities for the same set of counties.

Figure S.1: Full vaccinations in our analysis sample of counties

(a) Average total of vaccinated people (not pop.-weighted)



(b) Average share of vaccinated people (not pop.-weighted)

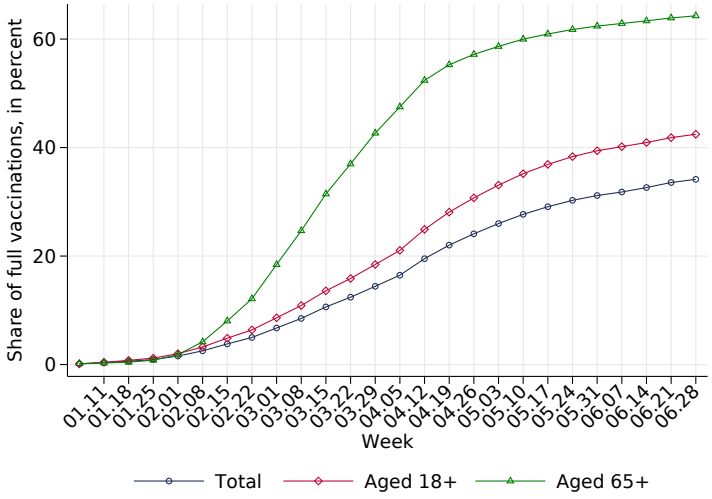
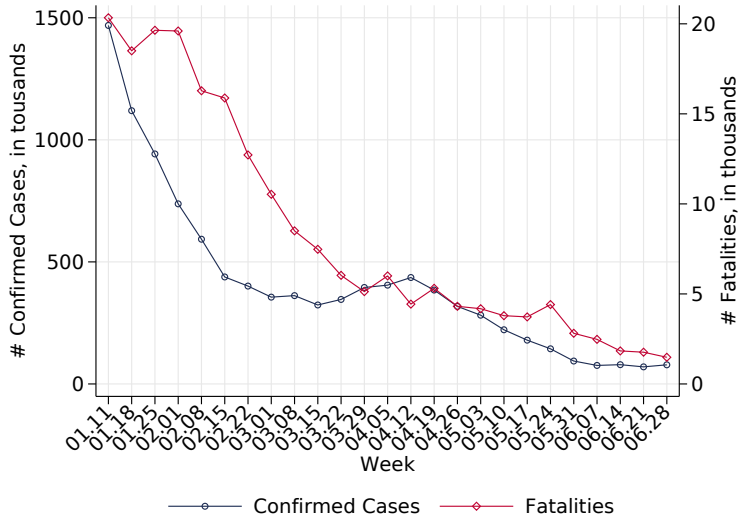


Figure S.2: Average number of COVID-19 confirmed cases and fatalities (not pop.-weighted)



S.2.2. ***Summary statistics for all variables***

Table S.1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
News channels					
FNC % of ratings (2020)	1.655	2.342	0	67.400	3042
MSNBC % of ratings (2020)	0.537	0.834	0	26.4	3042
CNN % of ratings (2020)	0.383	0.631	0	20.3	3042
FNC channel position (2016)	74.292	38.373	31.43	140.109	3036
MSNBC channel position (2016)	82.901	42.874	34.946	158.798	2999
CNN channel position (2016)	65.13	37.346	24.05	129.149	3039
% pop. zipcodes w/ access to FNC (2016)	0.92	0.164	0	1	3081
% pop. zipcodes w/ access to MSNBC (2016)	0.896	0.208	0	1	3044
% pop. zipcodes w/ access to CNN (2016)	0.925	0.159	0	1	3084
TV minutes average (2019)	116.829	23.154	45	260	338
Demographic					
Population	100526.181	317471.581	80	9818535	3042
Land area	511.685	664.989	1.553	9309.787	3042
Population density	187.898	919.263	0.129	33886.035	3042
Age imbalance	1.703	0.226	1.09	4	3042
% Aged 18+	0.765	0.032	0.607	0.902	3042
% Eligible food stamps	0.126	0.06	0	0.431	3042
% White	0.833	0.161	0.121	0.991	3042
% Black	0.089	0.144	0	0.851	3042
% Asian	0.011	0.023	0	0.439	3042
% Hispanic	0.081	0.127	0.003	0.958	3042
% Male gender	0.499	0.021	0.438	0.719	3042
% Without High School education	0.163	0.071	0.014	0.537	3042
% High School graduate	0.354	0.069	0.091	0.786	3042
% College graduate	0.192	0.085	0.054	0.706	3042
% Income 20 to 25 thousands	0.064	0.017	0	0.165	3042
% Income 25 to 30 thousands	0.061	0.015	0.014	0.157	3042
% Income 30 to 35 thousands	0.059	0.014	0	0.13	3042
% Income 35 to 40 thousands	0.054	0.013	0	0.134	3042
% Income 40 to 45 thousands	0.053	0.012	0	0.138	3042
% Income 45 to 50 thousands	0.046	0.011	0	0.105	3042
Political					
% Republican (1992 Pres. Elections)	0.504	0.112	0.135	0.892	3104
% Republican (1996 Pres. Elections)	0.505	0.117	0.107	0.882	3104
% Republican (2012 Pres. Elections)	0.597	0.146	0.072	0.959	3039
% Republican (2016 Pres. Elections)	0.639	0.153	0.083	0.953	3042
% Republican affiliation (Gallup 2012-2019)	0.586	0.253	0	1	2972
% Conservative affiliation (Gallup 2012-2019)	0.487	0.253	0	1	2983
% Republican affiliation (Gallup 2016-2019)	0.597	0.306	0	1	2703
% Conservative affiliation (Gallup 2016-2019)	0.476	0.307	0	1	2725

Variable	Mean	Std. Dev.	Min.	Max.	N
Occupation					
% Management and Professional	0.302	0.061	0.113	0.672	3042
% Services	0.179	0.034	0.074	0.387	3042
% Sales and Office	0.227	0.032	0.07	0.368	3042
% Construction	0.046	0.023	0.008	0.22	3042
% Production	0.16	0.057	0.013	0.368	3042
% Arts, Design, Entertainment, Sports, and Media	0.038	0.02	0.012	0.264	3042
% Medical (ACS)	0.05	0.01	0.027	0.142	430
% Retail (ACS)	0.059	0.009	0.031	0.091	430
% Agriculture and Farming (ACS)	0.004	0.007	0	0.067	430
% Manual and Industrial (ACS)	0.077	0.023	0.017	0.158	430
% Transport (ACS)	0.021	0.006	0.006	0.053	430
Health care and COVID-19					
# ICU Beds	30.473	94.968	0	2126	2438
# Hospitals	1.678	2.872	0	76	2438
CVAC Level of concern about a COVID-19 outbreak	0.5	0.289	0	1	3142
% COVID-19 Vaccine Hesitance (Surveyed)	0.191	0.053	0.05	0.323	3142
% Influenza vaccination (2016)	40.481	9.742	3	65	3126
% Influenza vaccination (2017)	41.741	9.775	4	66	3124
% Influenza vaccination (2018)	43.078	10.01	4	67	3124

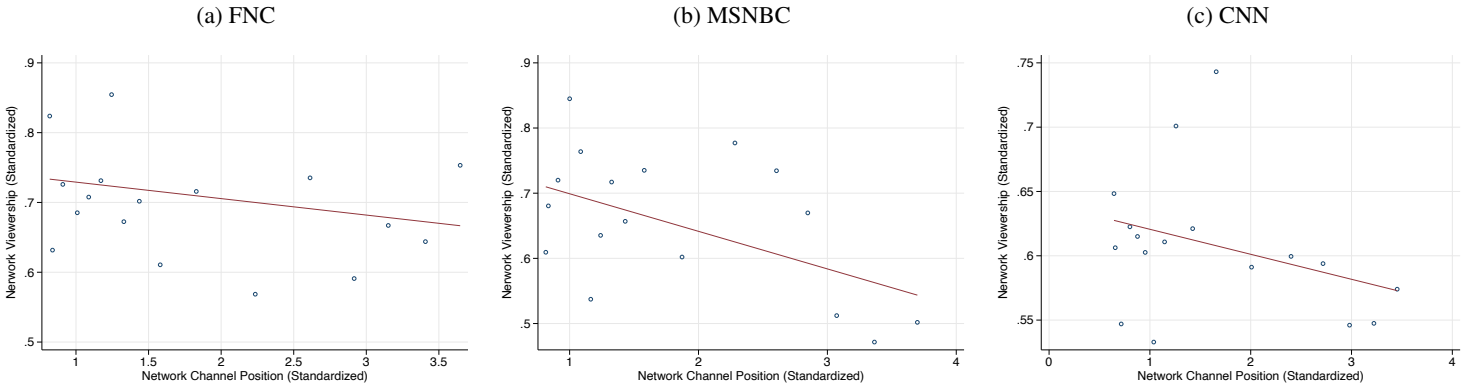
S.3. Instrument validity

We check here the two assumptions that are made for every IV analysis: relevance and exogeneity.

*S.3.1. **First stage***

First, we check for relevance, i.e. that the instruments – the networks' channel positions – are correlated with the networks' viewership. Figure S.3 shows the baseline negative correlation between channel position instrument and the relative network viewership, meaning that a lower channel position in the lineup is associated with higher viewership.

Figure S.3: Binned scatterplots for the correlation between viewership and channel position



We attempt to address the problem of a weak first stage – as faced in previous literature (Ash et al., 2020; Martin and Yurukoglu, 2017) for the networks CNN and MNBC – by accounting for the relative lineup position of the networks. For that purpose, we are taking the channel position of the network with highest viewership, FNC, for the calculation of the other networks' relative positions. While this alternative instrumentation improves the prediction of the viewership measures slightly, we still observe a weak first-stage F-statistic of 4.45 for MSNBC and 2.53 for CNN, and warn the readers of this caveat in our analysis in the main text. Coherent with other studies, we obtain a strong first-stage F-statistic of 13.85 for the Fox News Channel. We furthermore show in Figure S.6, that our results are virtually identical for FNC and CNN when using the standard instrumentation approach – of directly using the network's channel position on its viewership – but become noisy for MSNBC – with a first-stage F-statistic of 0.2.

Table S.2: First stage with networks relative channel position

Channel Position	FNC viewership	CNN viewership	MSNBC viewership
FNC	-0.04** (0.01)	—	—
CNN-FNC	—	-0.15* (0.07)	—
CNN-MSNBC	—	0.04 (0.03)	—
MSNBC-FNC	—	—	0.12* (0.06)
MSNBC-CNN	—	—	-0.17** (0.06)
Kleibergen-Paap rk Wald F-statistic	13.85	2.52	4.45

* $p < 0.05$, and ** $p < 0.01$.

S.3.2. ***Placebo checks***

Second, we run checks to support the hypothesis that channel positions are not correlated with local characteristics of the counties that could influence the vaccination decision. A series of empirical checks confirm that the instrument is exogenous (cf. Table S.3). For the main specification, we observe that, out of our five different instruments, three instruments each have only one variable showing a correlation with significance at the 5% level: above median White population for MSNBC-FNC, share of the population with education lower than high school for CNN-FNC, and land area for FNC.

Table S.3: Balance Checks on Channel Position Instruments

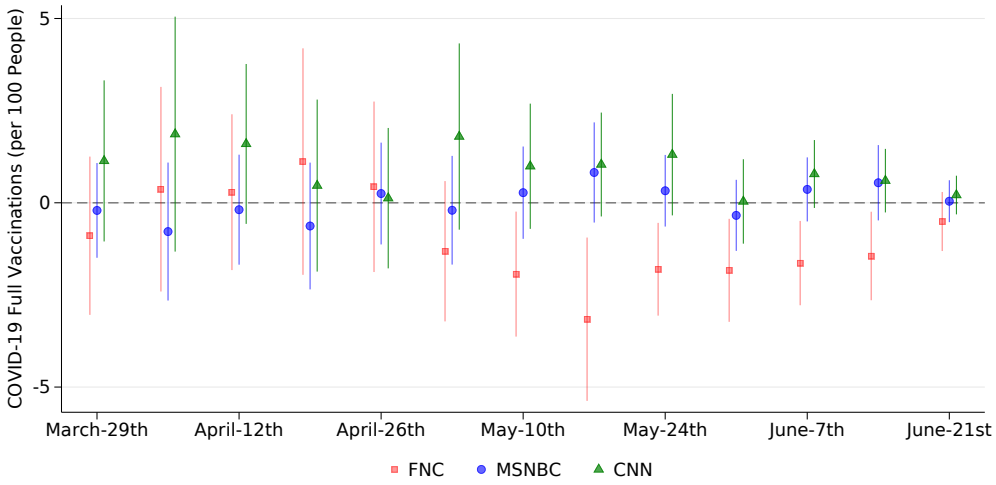
Variable	FNC	CNN-FNC	CNN-MSNBC	MSNBC-FNC	MSNBC-CNN
Age imbalance	0.0201	-0.119	-0.0668	0.0368	0.0664
	(0.0284)	(0.128)	(0.0463)	(0.0446)	(0.0459)
Food stamps	0.0756	-0.123	-0.0711	0.0366	0.0679
	(0.0391)	(0.121)	(0.0651)	(0.0455)	(0.0665)
College	-0.0685	0.243	0.0909	-0.0164	-0.0962
	(0.0373)	(0.147)	(0.0596)	(0.0478)	(0.0607)
Male	-0.0261	-0.0117	0.000347	-0.00660	-0.00104
	(0.0198)	(0.0635)	(0.0342)	(0.0289)	(0.0353)
No high school	-0.0294	0.168*	0.0837	-0.0335	-0.0802
	(0.0263)	(0.0743)	(0.0449)	(0.0515)	(0.0465)
Black pop. above median	-0.0631	0.0416	0.0521	-0.0424	-0.0506
	(0.0472)	(0.130)	(0.0710)	(0.0626)	(0.0708)
White pop. above median	0.0496	0.0971	-0.0645	0.0969*	0.0601
	(0.0312)	(0.0974)	(0.0481)	(0.0478)	(0.0486)
Population density	-0.0543	0.12	0.0824	-0.0498	-0.0875
	(0.0286)	(0.109)	(0.0521)	(0.0260)	(0.0574)
Area	0.0432*	0.0507	0.0297	-0.0162	-0.0316
	(0.0173)	(0.0389)	(0.0243)	(0.0195)	(0.0257)

Notes: We report in the table above a correlation check between our instruments and local characteristics. We run reduced form regressions with the specified characteristic as the outcome and other controls still on the right-hand side. Coefficients are standardized by the standard deviation. * $p < 0.05$, and ** $p < 0.01$.

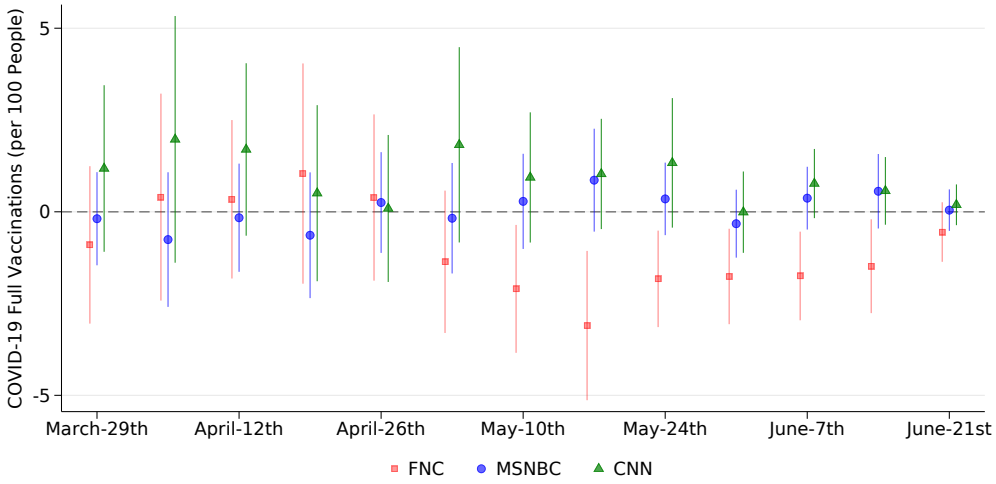
We investigate these unbalanced characteristics by checking if they are systematically correlated with the outcome of interest. We include these characteristics as controls in our main specification and we furthermore verify our results to be robust when adding them as polynomials (Figures S.4) or when interacting them with the instruments (Figures S.5).

Figure S.4: Main results with polynomials of problematic demographics (2SLS)

(a) Polynomials for % White



(b) Polynomials for % with no high school education



(c) Polynomials for land area

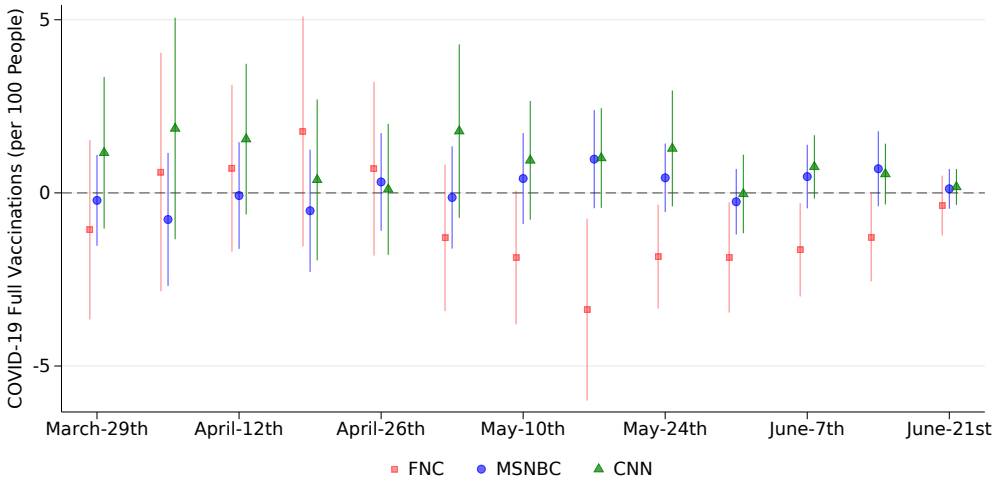
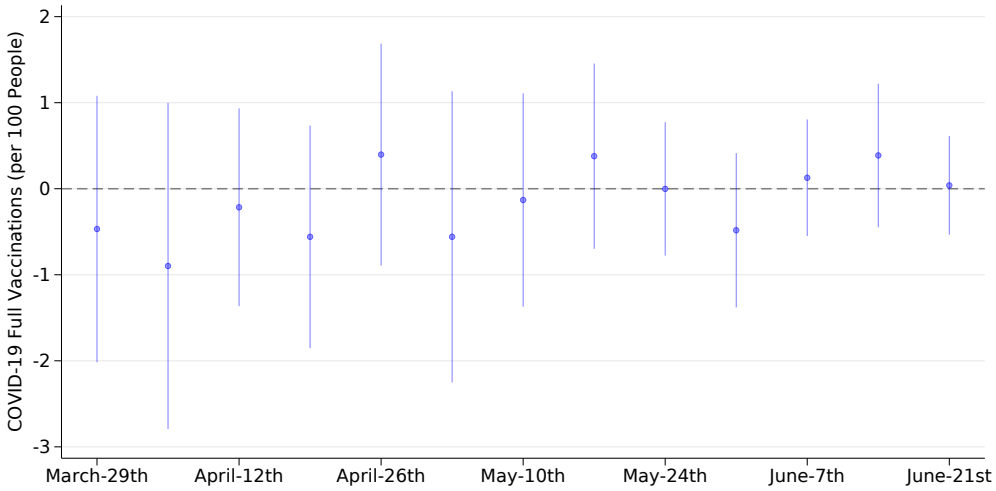
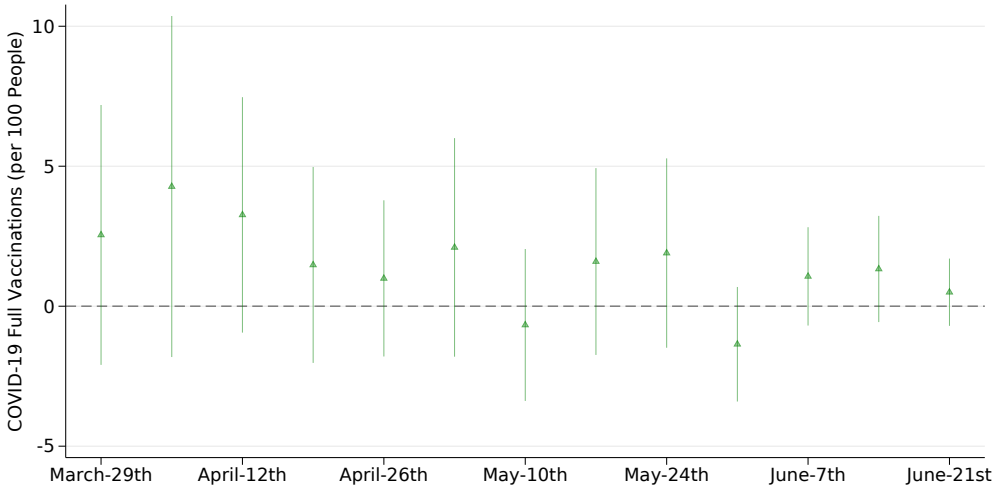


Figure S.5: Main results adding interactions with viewership, for problematic demographics (2SLS)

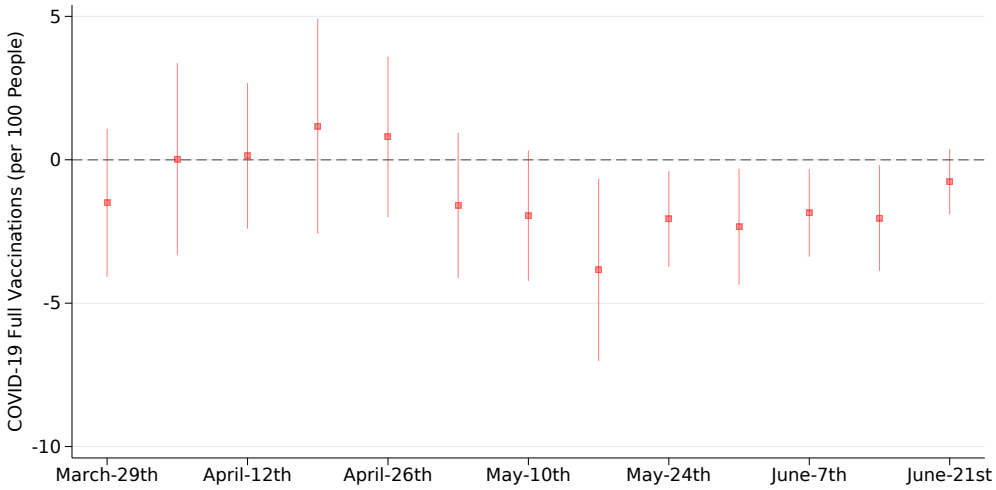
(a) Interaction for % White (MSNBC)



(b) Interaction for % with no high school education (CNN)



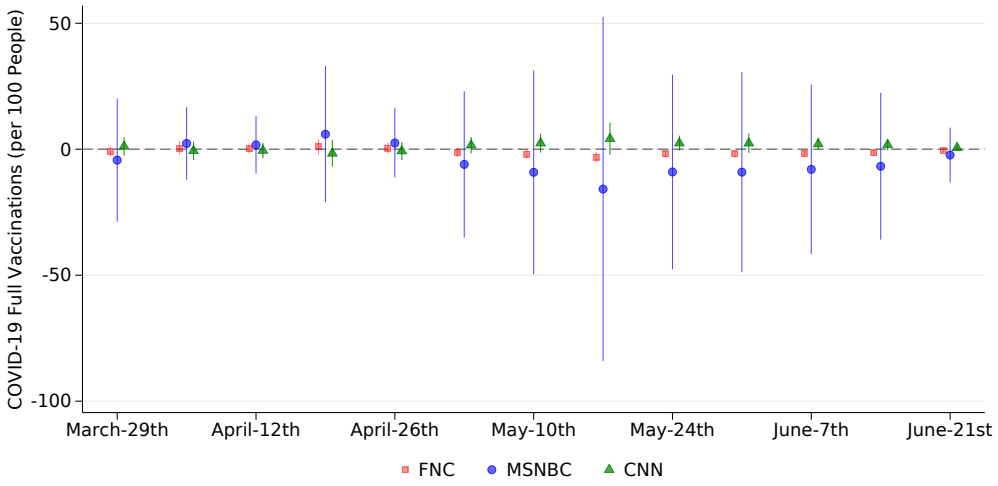
(c) Interaction for land area (FNC)



*S.3.3. **Alternative IV approach***

In the main results, the CNN and MSNBC viewership measures are instrumented with the relative channel position of the other two channels, respectively. Figure S.6 presents the main results instrumenting directly with their channel position. While the first-stage F-statistic for the CNN model stays similar (F-statistic $= 2.5$), it significantly drops for the MSNBC model (F-statistic $= 0.2$).

Figure S.6: Main results using the same IV for all three channels, total population (2SLS)



S.4. Tables for main results

Table S.4 presents the main results in a regression table format for all three channels separately.

Table S.4: Effect of Cable News viewership on COVID-19 full vaccinations, 2SLS

	Network Viewership		
	FNC	MSNBC	CNN
March 29	-0.893	-0.206	1.136
	(1.067)	(0.639)	(1.086)
April 5	0.369	-0.780	1.863
	(1.379)	(0.939)	(1.583)
April 12	0.288	-0.187	1.597
	(1.050)	(0.741)	(1.077)
April 19	1.119	-0.630	0.467
	(1.526)	(0.854)	(1.159)
April 26	0.434	0.251	0.125
	(1.149)	(0.686)	(0.946)
May 3	-1.314	-0.202	1.797
	(0.946)	(0.733)	(1.255)
May 10	-1.934**	0.275	0.992
	(0.842)	(0.622)	(0.844)
May 17	-3.158***	0.823	1.039
	(1.100)	(0.675)	(0.700)
May 24	-1.803***	0.327	1.307
	(0.625)	(0.483)	(0.819)
May 31	-1.832**	-0.341	0.0364
	(0.694)	(0.479)	(0.569)
June 7	-1.636***	0.364	0.782
	(0.569)	(0.432)	(0.458)
June 14	-1.443**	(0.544)	0.601
	(0.596)	(0.507)	(0.428)
June 21	-0.508	0.0434	0.210
	(0.398)	(0.282)	(0.261)

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

S.5. Other outcomes for all networks

Table S.5: Further outcome measures (2SLS)

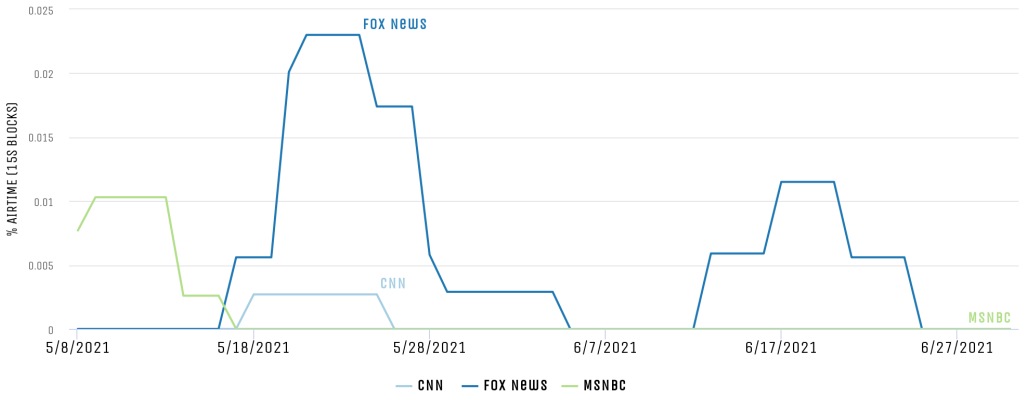
Outcome	FNC	MSNBC	CNN
Vacc. Hesitancy	0.04^{+} (0.02)	-0.02 (0.01)	0.02 (0.02)
Outbreak Concern	0.01 (0.10)	0.07 (0.07)	-0.06 (0.10)
ICU Beds (#)	490 (1135)	-569 (384)	-138 (433)
Hospitals (#)	26 (41)	-19 (12)	-1 (15)
2016 Flu Vacc. (%)	-0.58 (7.46)	-0.11 (6.72)	9.34 (8.21)
2017 Flu Vacc. (%)	-0.45 (7.98)	0.05 (6.31)	9.82 (7.65)
2018 Flu Vacc. (%)	-0.05 (8.47)	-0.16 (6.36)	9.36 (8.58)

Notes: Two Stages Least Squares estimates for further outcome measures, following main graphs specification. Estimates are relative to a one s.d. increase in the network's viewership. $^{+}$ $p < 0.10$, * $p < 0.05$, and ** $p < 0.01$.

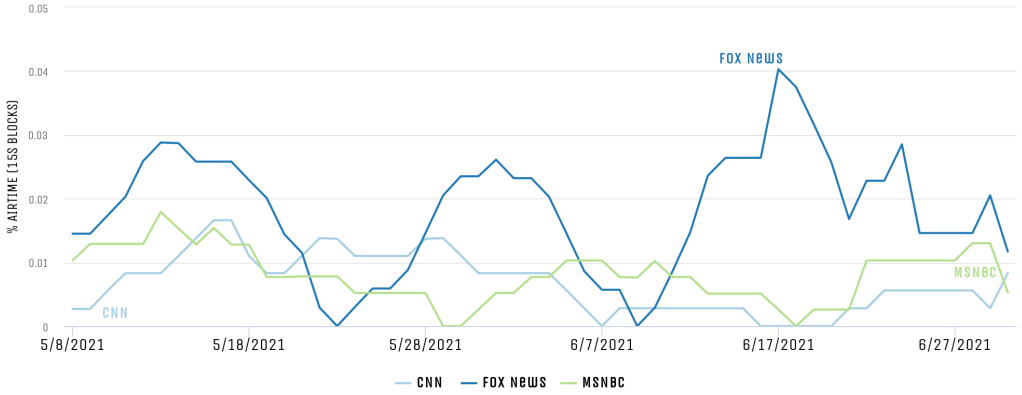
S.6. Networks discourse

Figure S.7: Divergent narratives on vaccines by networkin May-June 2021

(a) “vaccine big pharma”



(b) “vaccine bad”



Notes: Each panel presents the smoothed frequencies of each phrase in the major news channels. This figure S.7 was produced using the GDELT Television Comparer API (accessible at https://api.gdeltproject.org/api/v2/summary/summary).[a]

[a]The GDELT API is a flexible news search interface, where one can specify specific networks and specific days to provide statistics on relative frequencies for user-provided search queries.

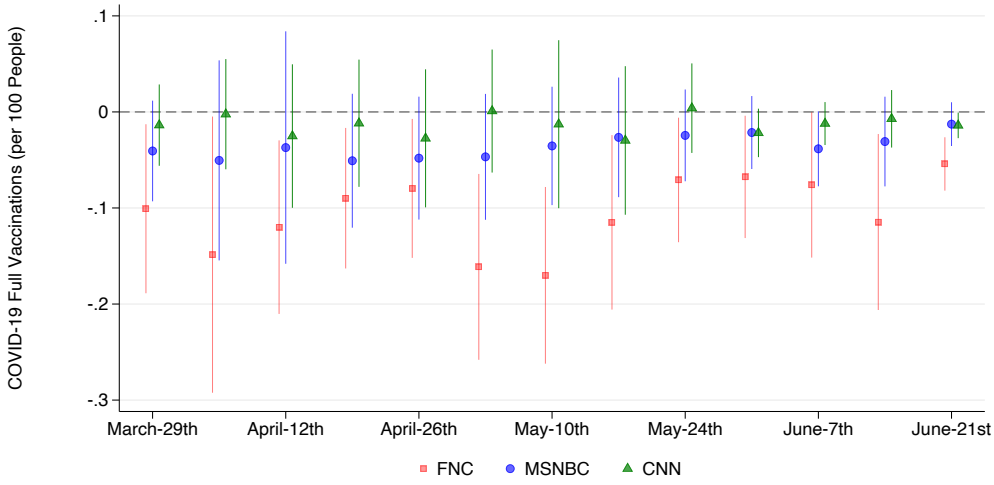
S.7. Robustness checks

S.7.1. OLS estimates for main results

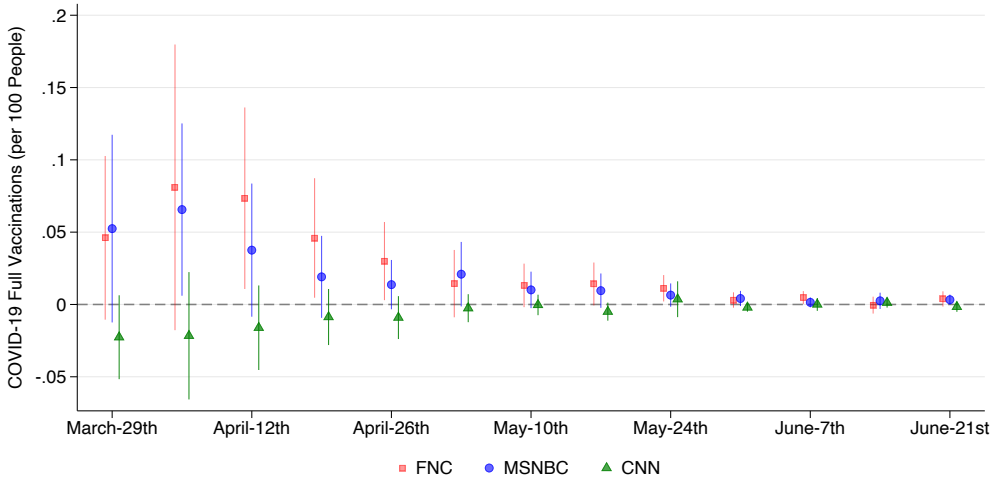
Figure S.8 reports the OLS estimates of the main results by age categories for all three channels.

Figure S.8: Effect of networks viewership by age category (OLS)

(a) Aged between 18 and 65



(b) Aged above 65

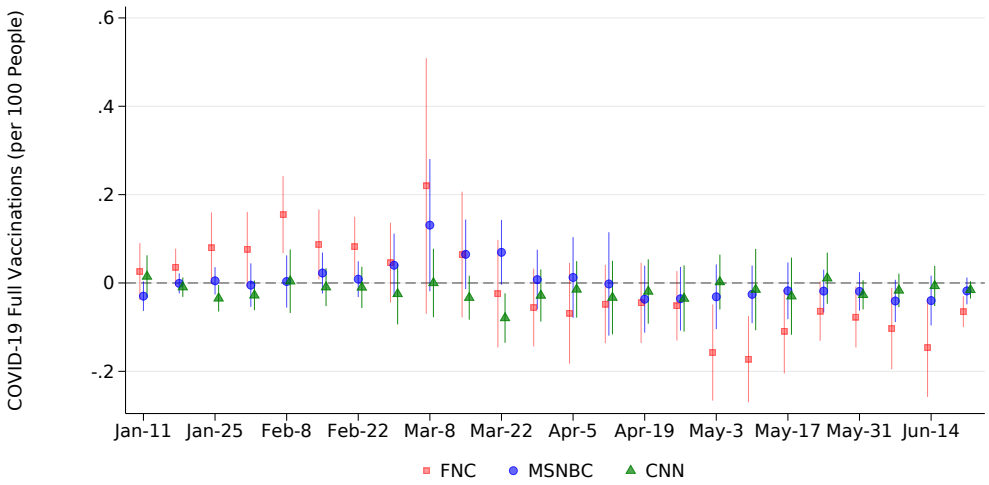


S.7.2. ***Results with extended period of analysis***

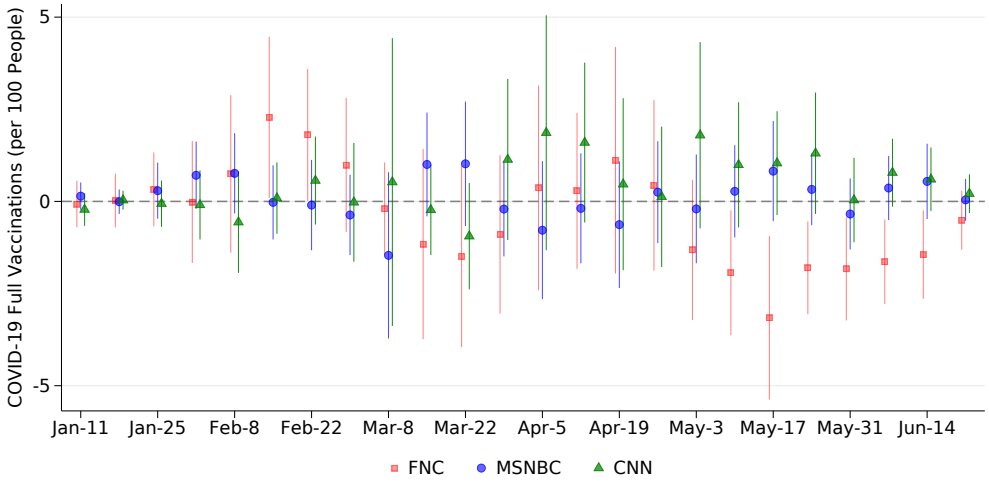
In figure S.9, we show the results of the main model for all weeks (starting with the week of January 11th, 2021). Since the geographical coverage of COVID-19 full vaccinations is smaller for early weeks, the county composition of regressions before our main results is not the same and affects instrument relevance.

Figure S.9: Main results including all weeks, total population

(a) OLS



(b) 2SLS



S.7.3. ***Partisanship and ideology checks***

Figure S.10 shows main results controlling for the Republican share at the 1992 and 1996 presidential elections. In Figure S.11, we interact each presidential election variable with the respective channel position instrument.

Figure S.10: Main results with presidential elections controls, total population (2SLS)

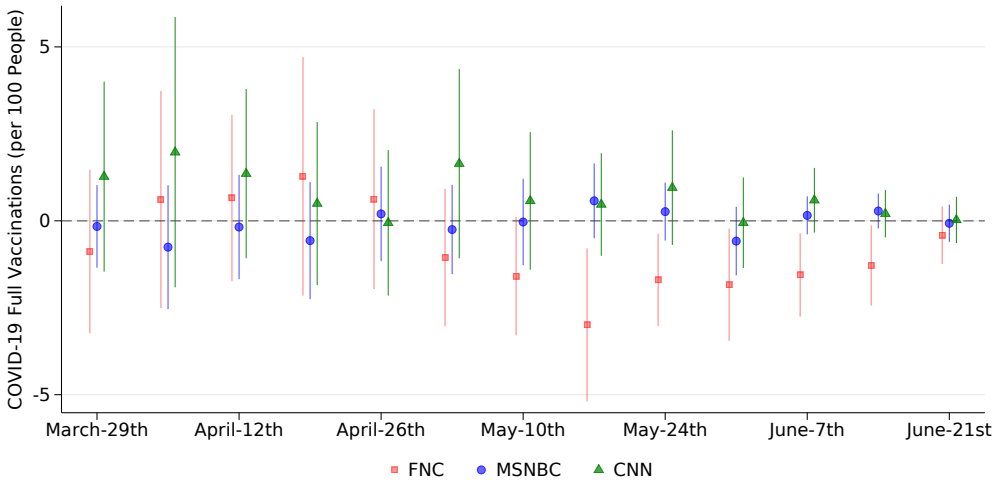
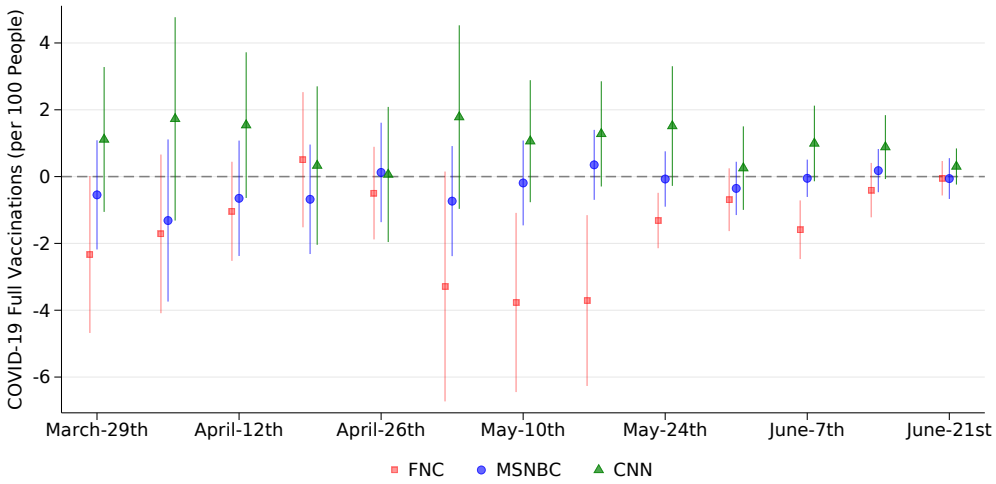


Figure S.11: Main results interacting presidential election controls with media viewership, total population (2SLS)

(a) 1992 presidential election



(b) 1996 presidential election

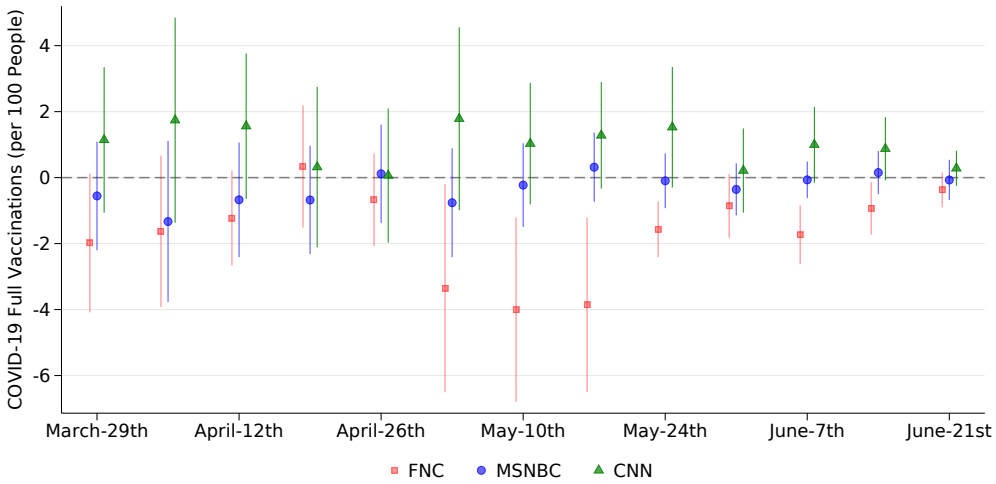
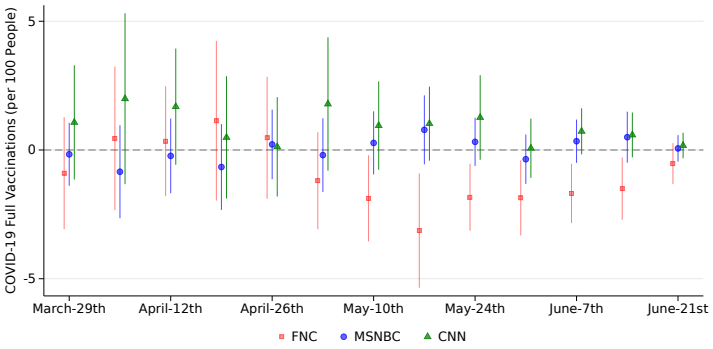


Figure S.12 shows the main results controlling for the self-reported Republican and conservative affiliation from Gallup. We also interact those two estimates (2012-2019 and 2016-2019) with the respective channel position instrument in Figure S.13.

Figure S.12: Main results controlling for self reported political affiliation (2016-2019), total population (2SLS)

(a) 2016-2019 estimates



(b) 2012-2019 estimates

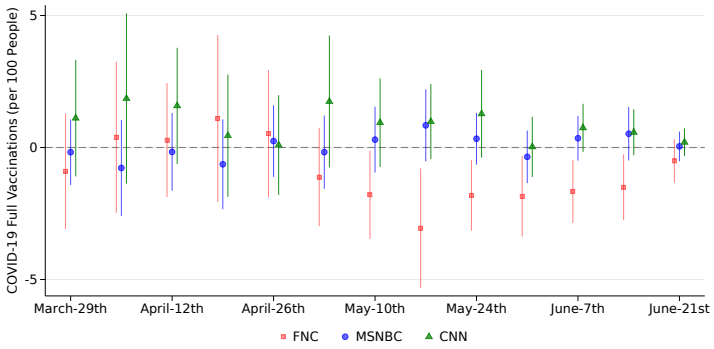
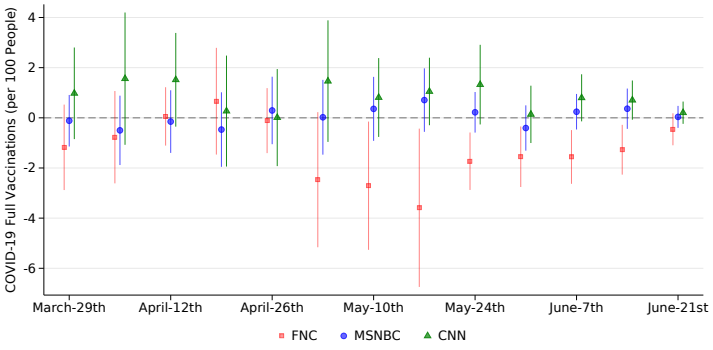
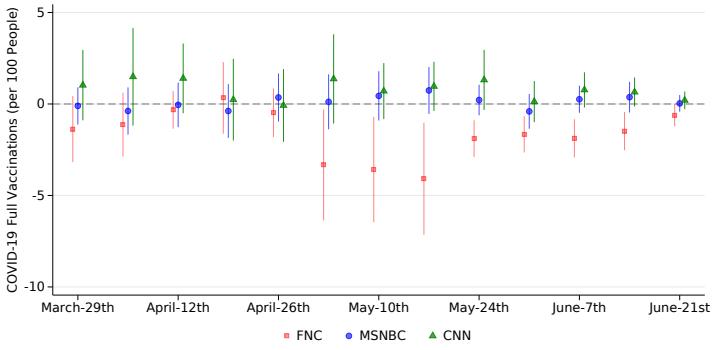


Figure S.13: Main results interacting self reported political affiliation with channel position, total population (2SLS)

(a) 2016-2019 estimates



(b) 2012-2019 estimates



*S.7.4. **Television viewership checks***

In Table S.6, we use data on time spent watching TV (Average Time Use Survey) as an outcome in our analysis. Results show that the individual viewership of each network has no impact on the time spent watching TV. In Figure S.14, we also show that our main results are robust to the inclusion of this variable as control considering the reduced sample size.

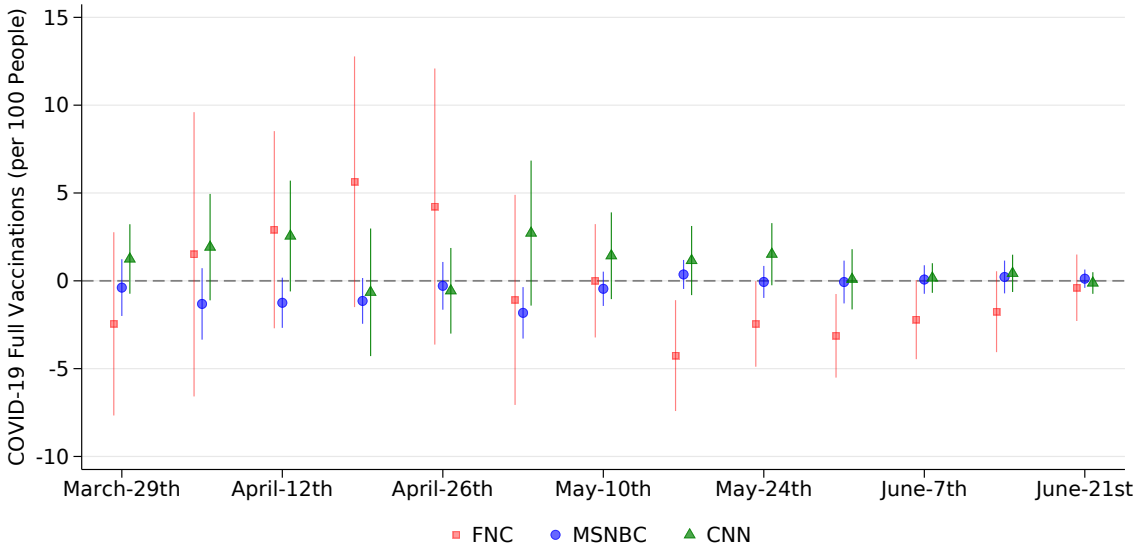
Table S.6: Daily television viewership as alternative outcome (2SLS)

	# minutes spent on TV		
FNC Viewership	-4.080	—	—
	(41.73)		
MSNBC Viewership	—	2.643	—
		(12.94)	
CNN Viewership	—	—	-0.0250
			(22.76)
Observations	329	329	329
R^2	-0.006	0.002	0.000

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure S.14: Main results including television daily viewership (2015-2019), total population (2SLS)

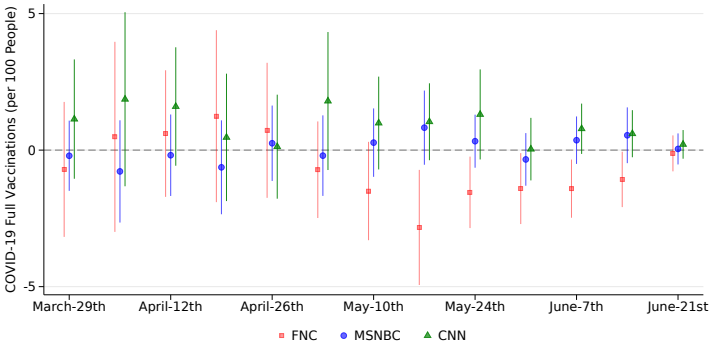


S.7.5. ***Health and health care sector checks***

COVID-19 cases and fatalities. Figure S.15 shows our results controlling for COVID-19 cases and fatalities. In Panel S.15a, we control for cumulative confirmed cases and fatalities for the same week as the outcome. In Panel S.15b, we control for weekly new confirmed cases and fatalities lagged by four weeks compared to the outcome. We observe that results largely remain unchanged under these specifications. The same is true when interacting these measure with the instruments (cf. Figure S.16).

Figure S.15: Main results controlling for cumulative COVID-19 cases and fatalities, total population (2SLS)

(a) Controlling for current cum. cases and fatalities



(b) Controlling for lagged weekly cases and fatalities before

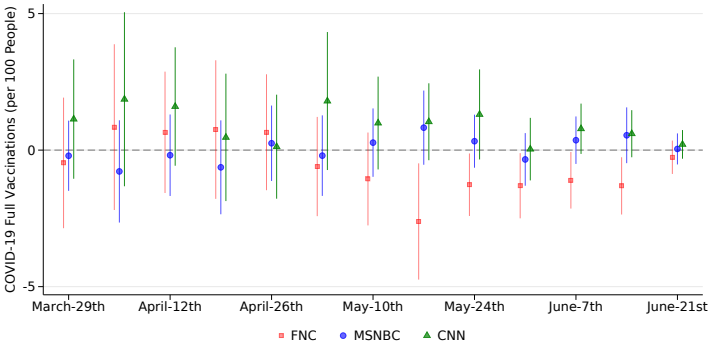
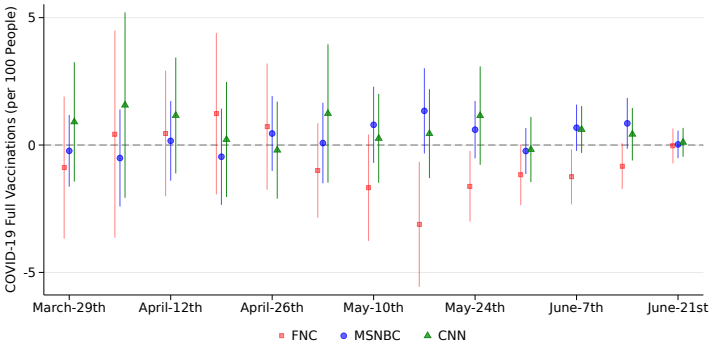
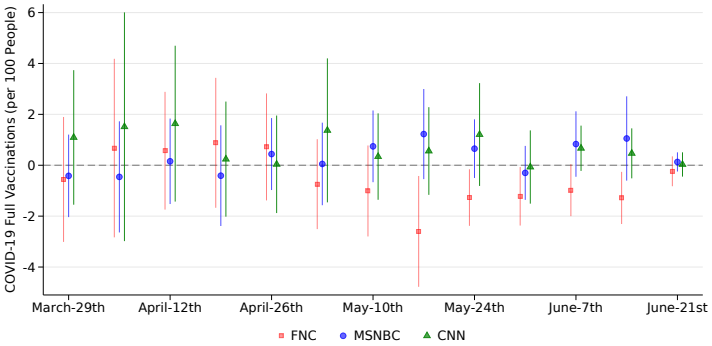


Figure S.16: Interaction with instrument, total population (2SLS)

(a) Current cumulative COVID-19 cases and fatalities



(b) Weekly COVID-19 cases and fatalities, 4 weeks before



Vaccine hestiancy and outbreak risk. Table S.7 reports the impact of viewership on vaccine hesitancy and the ability to handle a COVID-19 outbreak. When using those variables as outcomes in our main analysis, we observe a positive effect at the 10% level on vaccine hesitancy for FNC. When we instead included these variables as controls, we still see a negative and statistically significant effect on COVID-19 vaccinations for FNC after the week of May 10th (cf. Figure S.17).

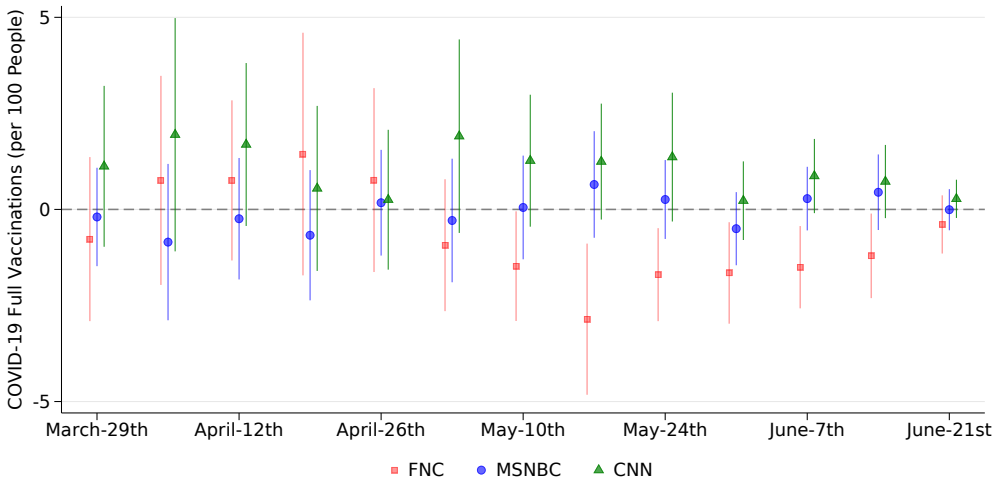
Table S.7: Vaccine hesitancy and CVAC level of concern as alternative outcomes (2SLS)

	Alternative COVID-19 Outcomes					
	% Hesitant	% Hesitant	% Hesitant	Outbreak concern	Outbreak concern	Outbreak concern
FNC Viewership	0.0369*	—	—	0.0131	—	—
	(0.0190)			(0.0960)		
MSNBC Viewership	—	-0.0167	—	—	0.0736	—
		(0.0121)			(0.0747)	
CNN Viewership	—	—	0.0215	—	—	-0.0598
			(0.0174)			(0.0995)
Observations	2996	2996	2996	2996	2996	2996
R^2	-1.634	-0.633	-0.899	-0.008	-0.244	-0.140

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure S.17: Main results controlling for COVID-19 vaccine hesitancy and CVAC level of concern, total population (2SLS)



Number of ICU beds and hospitals. Table S.8 reports the impact of networks viewership on counties number of ICU beds and hospitals pre-COVID-19. Using the main model, we don't find any statistically significant coefficients for all three channels. Used as controls in the model from the main, on figure S.18 we still see a negative and statistically significant impact on COVID-19 vaccinations for FNC after the week of May 10th.

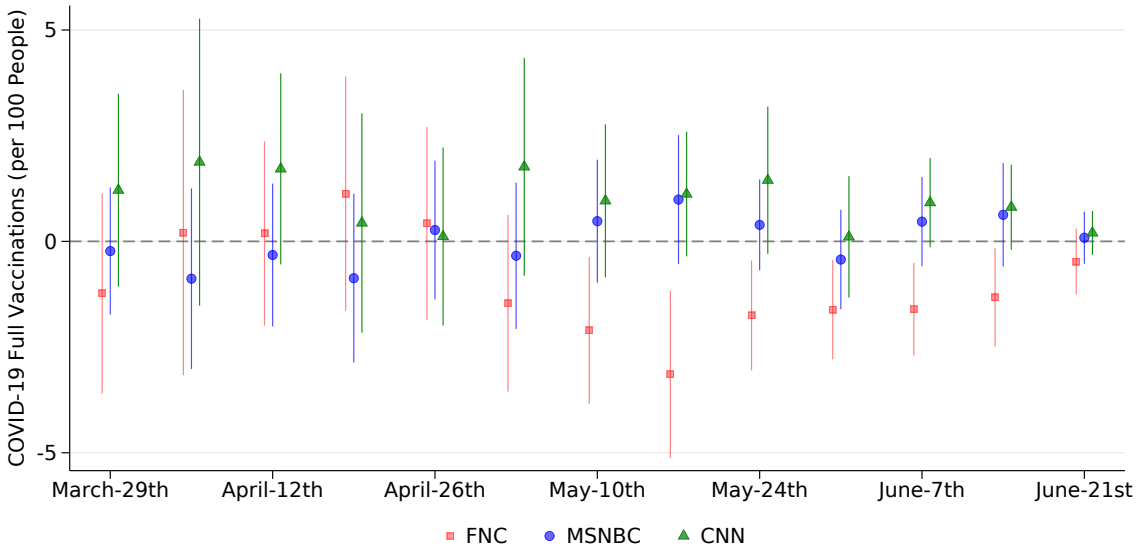
Table S.8: Number of ICU beds and hospitals as alternative outcomes (2SLS)

	Health outcome					
	# ICU beds	# ICU beds	# ICU beds	# hospitals	# hospitals	# hospitals
FNC Viewership	490.0	—	—	25.97	—	—
	(1135.3)			(40.79)		
MSNBC Viewership	—	-569.2	—	—	-18.54	—
		(383.5)			(12.36)	
CNN Viewership	—	—	-137.5	—	—	-0.955
			(432.9)			(14.80)
Observations	2372	2372	2372	2372	2372	2372
R^2	-0.323	-0.786	-0.061	-0.820	-0.750	-0.005

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure S.18: Main results controlling for ICU beds and hospitals, total population (2SLS)



Influenza vaccinations. Table S.9 reports the effect of the networks viewership on counties share of influenza vaccination in 2016, 2017 and 2018. We do not observe a statistically significant effect for the three networks. Figure S.19 show that our main results or robust to the inclusion of these variables as controls.

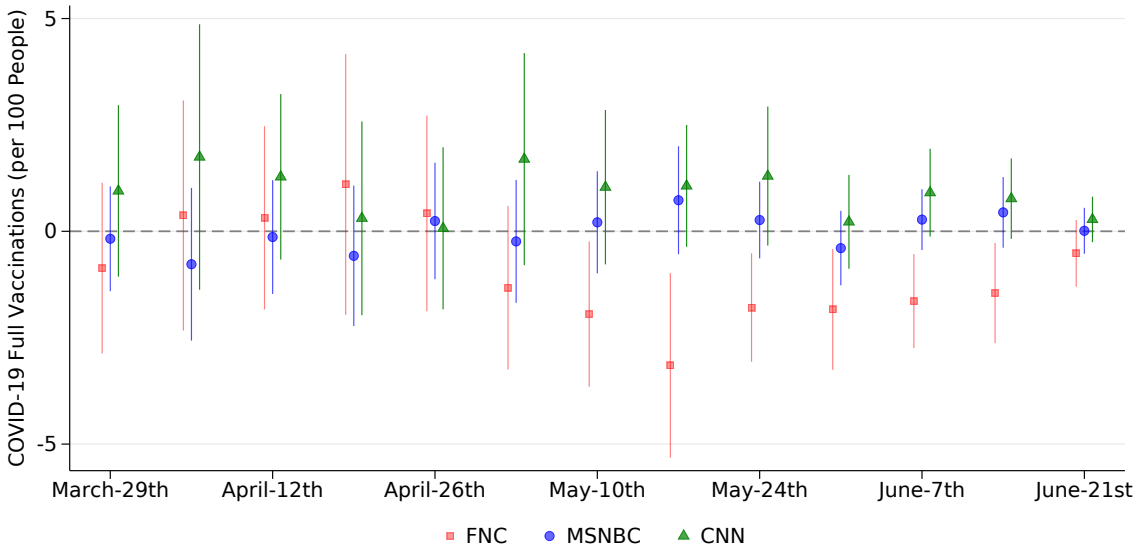
Table S.9: Share of influenza vaccination, 2016, 2017 and 2018 as alternative outcomes (2SLS)

	Influenza vaccination year								
	2016	2016	2016	2017	2017	2017	2018	2018	2018
FNC Viewership	-0.579	—	—	-0.453	—	—	-0.0523	—	—
	(7.464)			(7.976)			(8.472)		
MSNBC Viewership	—	-0.114	—	—	0.0516	—	—	-0.159	—
		(6.718)			(6.307)			(6.365)	
CNN Viewership	—	—	9.344	—	—	9.825	—	—	9.359
			(8.211)			(7.653)			(8.585)
Observations	2994	2994	2994	2993	2993	2993	2993	2993	2993
R^2	-0.005	-0.001	-0.948	-0.004	0.000	-1.024	-0.000	-0.001	-0.919

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure S.19: Main results controlling for 2016, 2017 and 2018 influenza vaccination (2SLS)



*S.7.6. **Specification checks***

In Figure S.20 and S.21, we present the main results by excluding one control variable at a time (leave-one-out test). Therefore, 11 regressions are stacked on the same graph, leaving out each time one of the socio-demographics and political preferences controls from the main specification.

Figure S.20: Leave-one-out test with control variables, FNC channel, total population (2SLS)

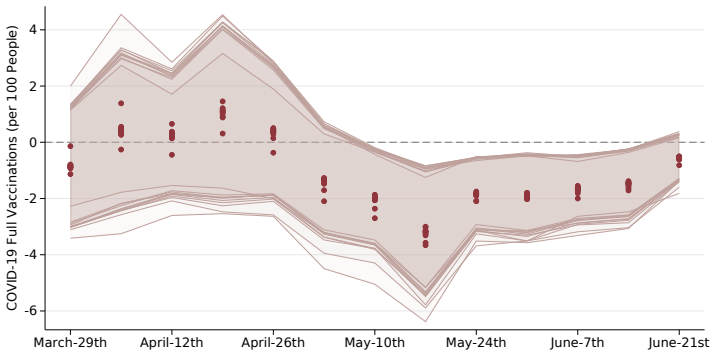
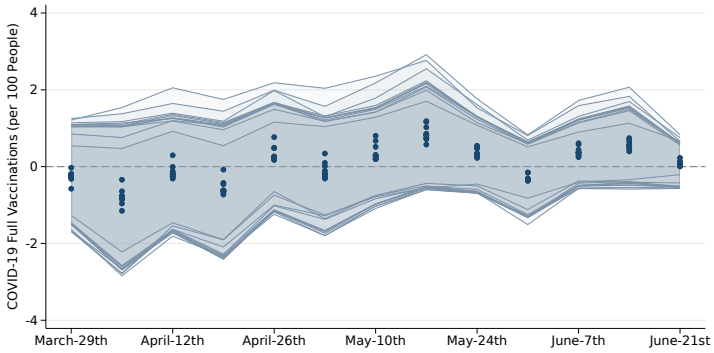


Figure S.21: Leave-one-out test with control variables, other channels, total population (2SLS)

(a) MSNBC



(b) CNN

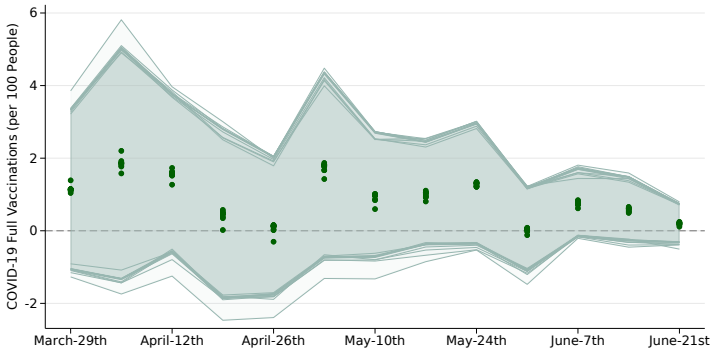
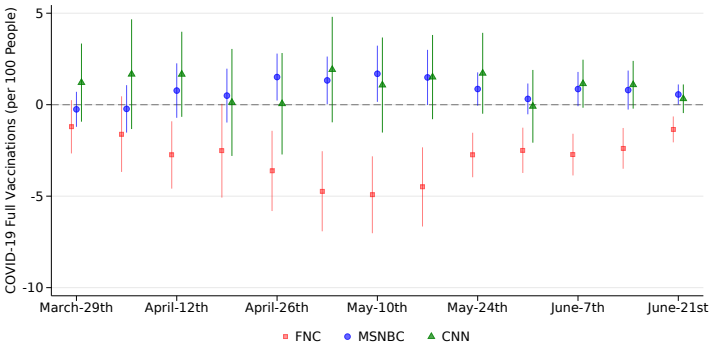


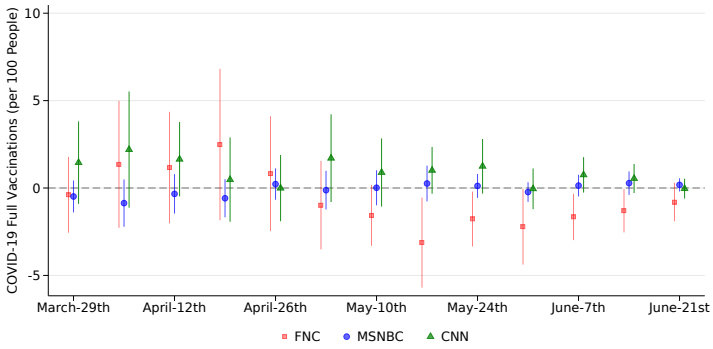
Figure S.22 shows the results using different sets of covariates. In Figure (a), we exclude the socio-demographic and political preferences controls, keeping only the controls for viewership and channel positions for the other networks. In Figure (b), we include a greater set of covariates: for ethnicities (a dummy for above-median hispanic population share and asian population share), education (proportion who attended high school), the share of population living in zip codes with access to the network, and a set of controls for the share of the population employed in different sectors: management and professional, services, sales and office, construction, production, arts/design/entertainment.

Figure S.22: Main results controlling for different covariates, total population (2SLS)

(a) Without Census demographics variables

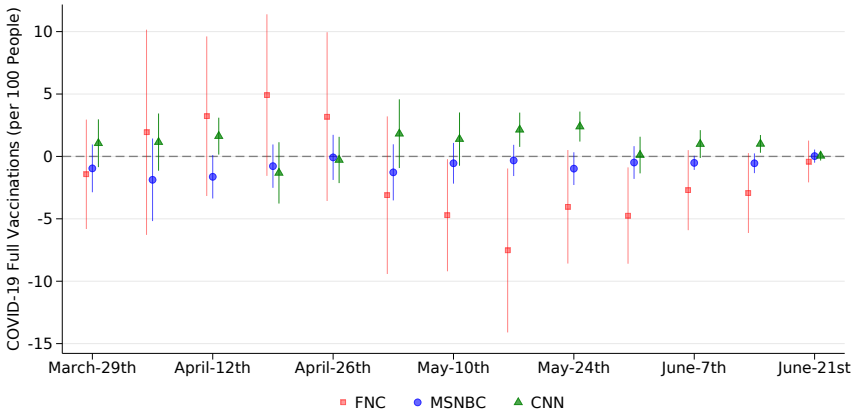


(b) With more socio-demographic controls



In Figure S.23, we replace the Census Bureau occupation variables from (b) with more recent occupational data from the American Community Survey (ACS), also provided by the Census Bureau. The survey includes share from the following sectors: medical, retail, agriculture, industrial and transport occupations.

Figure S.23: Main results with ACS occupation variables, total population (2SLS)



S.7.7. ***Sample checks***

In Figures S.24 and S.25, we present the main result following a perturbation test that excludes one of the 47 states at a time. Therefore, 47 regressions are stacked on the same graph, the dots represents estimates and the colored area represents the overlaid 95% confidence intervals.

Figure S.24: Perturbation test by leaving one state out, FNC channel, total population (2SLS)

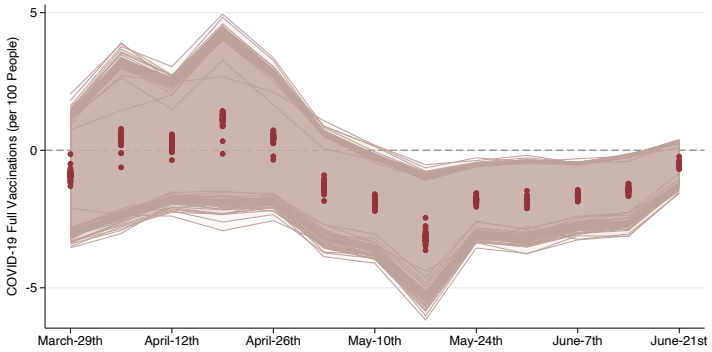
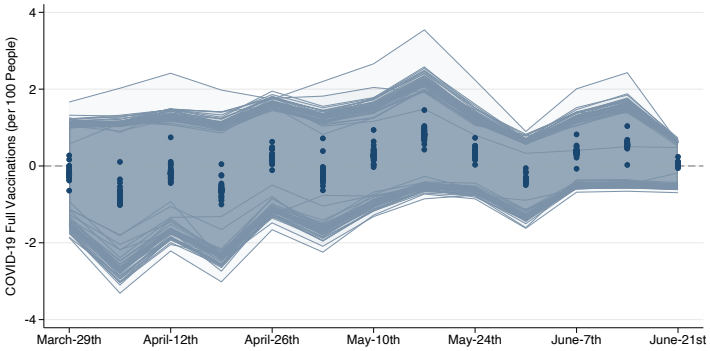


Figure S.25: Perturbation test by leaving one state out, other channels, total population (2SLS)

(a) MSNBC



(b) CNN