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Too afraid to vote? The effects of COVID-19 on voting behaviour☆

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ABSTRACT

This paper studies the causal effect of local exposure to COVID-19 on voting behaviour and electoral outcomes using evidence from the regional elections held in Spain on 12 July 2020. Exploiting the variation in exposure to COVID-19 and using a difference-in-differences identification strategy, we show that turnout was between 2.6 and 5.1 percentage points lower in municipalities that experienced positive cases of COVID-19. In addition, the results show a substantial increase in the probability of voting for nationalist parties. We discuss the idea of perceived fear being the potential mechanism driving our results.

1. Introduction

The COVID-19 global pandemic has created unique political and economic challenges. Governments have to face a global health problem that not only jeopardises the lives of millions of citizens but also has severe effects on, among others, economic growth (Guerrieri et al., 2020), inequality (Blundell et al., 2020; Hacioglu et al., 2020), mental health (Brodeur et al., 2020; Fetzer et al., 2020), and domestic violence (Bullinger et al., 2020). In addition, the management of the situation is prone to create important trade-offs between rigid measures to contain the transmission of the virus and civil liberties (Amat et al., 2020).

Indeed, the COVID-19 has the potential to endanger democracy (Amat et al., 2020). As time goes by, more countries have to decide between celebrating elections under uncertain circumstances or postponing them. Which of these is the best choice remains unclear. As Prof. Toby James states *"Intuitively, we think postponing an election sounds anti-democratic, […] but actually democracy in*

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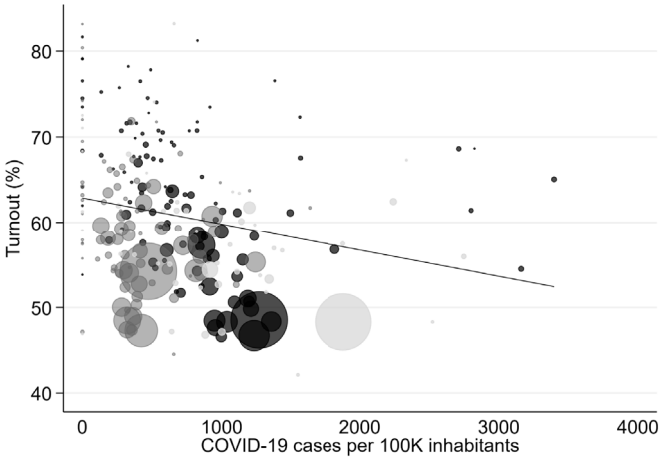


Notes: Figure 1 shows the correlation between the confirmed cases of COVID-19 and the turnout at the municipal level. The size of the markers represents the population of the municipality. The municipalities represented in black, dark grey and light grey belong to the provinces of Bizkaia, Gipuzkoa, and Alava respectively. The black line represents the fitted values of a linear regression model. Samaniego, a municipality with 8,000 cases per 100K inhabitants, is excluded for visualisation reasons, but this negative correlation is robust to its inclusion. Figure A1 shows also a negative association between turnout and exposure to deaths caused by COVID-19.

Fig. 1. COVID-19 Cases and Turnout.

some ways could be undermined by holding an election in these times".[1,2]

This paper is, to the best of our knowledge, the first to examine the causal effects of local exposure to COVID-19 on voting behaviour and electoral outcomes. We use evidence from the regional elections held in the Basque Country, Spain, on 12 July 2020. We combine data at the municipal level on (i) the number of confirmed COVID-19 cases and deaths per 100,000 inhabitants since the outbreak of the pandemic to the week before the elections, and on (ii) participation rates and vote shares for the main political parties.

The Basque Country, with more than 2.1 million inhabitants (i.e. 4.7% of the national population), presents an interesting case to study, with a social and economic context comparable to other developed regions and countries worldwide. This region, located in the North of Spain, is among the wealthiest in the country and has a very solid industrial base. According to Eurostat, the GDP per capita in purchasing power standards (PPS) in the Basque Country amounted 36,300 in 2017, far above the Spanish (27,600) and EU (30,000) averages. In addition, the unemployment rate in 2018 was 10%, compared to the averages of 15.3% in Spain and 6.9% in the EU.

To set the stage for our analysis, we first document a negative correlation between exposure to COVID-19 and turnout at the municipal level (see Fig. 1).[3] To estimate the causal effect of exposure to COVID-19 on voting behaviour and electoral outcomes, the primary empirical strategy compares voting decisions in municipalities with *(treated group)* and without *(control group)* positive cases of COVID-19 in elections both before and after the outbreak of the pandemic. We include municipality, province, and election-year fixed-effects in all specifications to control for overall trends in electoral outcomes and all time-invariant differences across municipalities.

The main results show that the turnout was between 2.6 and 5.1 percentage points lower in municipalities with positive cases of COVID-19. We also find an increase in the vote shares to the nationalistic Basque parties that ranged from 2.1 to 4.9 percentage points. These results are robust to the inclusion of controls and to a battery of alternative specifications, including different definitions of control and treatment groups.

This paper contributes to several strands of the literature. First, this research is closely related to the very recent and scarce liter-

[1] See CNN post by Julia Hollingsworth and Yoonjung Seo: *"South Korea is holding an election during the coronavirus crisis. Other countries are postponing theirs. Either way, democracy may suffer"*, available at https://edition.cnn.com/2020/04/13/asia/elections-coronavirus-pandemic-intl-hnk/index.html (site accessed on 13 September 2020).

[2] For example, elections may weaken democracy if the outcome under-represents the voice of voters that would have liked to participate but decided against it for fear of being affected by or exposed to the infection.

[3] Notice that the levels of participation in the first elections in Spain during COVID-19 times were a big question mark. Newspapers were repeatedly reporting news related to how COVID-19 could increase abstention (see, for example, https://www.elindependiente.com/politica/2020/06/30/la-abstencion-agita-los-pronosticos-del-12-j-si-hay-un-rebrote-puede-haber-sorpresas/(site accessed on 20 December 2020) or https://www.lavanguardia.com/politica/20200701/482040672145/elecciones-euskadi-galicia-12-j.html (site accessed on 20 December 2020)). These new releases may have, per se, affected the participation rates. Brugarolas and Miller (2021) find that the release of polls increases turnout intentions by 5%.

ature analysing the effects of epidemics on electoral behaviour. Beall et al. (2016) show correlational evidence that voter intentions favouring the Republican Party increased in places with more intense concerns about Ebola.[4] Similarly, Campante et al. (2020) find that Ebola worries caused a decrease in the Democratic vote share in the 2014 midterm elections and lower voter turnout. Mansour et al. (2020) study the effect of exposure to HIV/AIDS on vote shares for the U.S House of Representatives. They find a positive association between HIV/AIDS mortality and the vote share received by Democratic candidates. Related to the COVID-19 pandemic, Adam-Troian et al. (2020) study the first round of 2020 French municipal elections and find that areas where the perceived threat of COVID-19 was higher showed more support for conservative parties. Interestingly, they do not find that the real COVID-19 threat had any effect on vote shares. Bisbee and Honig (2020) find that exposure to COVID-19 decreased support for Bernie Sanders in the U.S. Democratic Party presidential primaries. They hypothesise that Sanders might be seen as a less secure option by anxious voters.

More broadly, this paper also relates to the recent research that studies the political effects of the lockdown caused by COVID-19. Bol et al. (2020) find that lockdowns increased the intention to vote for the incumbent, trust in the government, and satisfaction with democracy in Western European countries. De Vries et al. (2020) show that the support to incumbents in several European countries increased after the introduction of restrictions in Italy. Giommoni and Loumeau (2020), using evidence from the French municipal elections, find that in localities with stricter lockdowns the support for the incumbent and for Green parties was higher, and the voter turnout was also larger. Using experimental data from New Zealand, Sibley et al. (2020) show that people exposed to more restrictive measures had increased levels of trust in science, politicians, and the police. For Spain, Amat et al. (2020) find that the pandemic increased support for strong leadership and technocratic governments.

Last but not least, this paper is connected to the literature that studies the political impact of threats such as terrorism/conflicts or natural disasters on electoral outcomes. Bellows and Miguel (2009), focusing on the 1991–2002 Sierra Leone civil war, conclude that households with higher exposure to war were more likely to vote. Gardeazabal (2010) looks at the effect of terrorism on voting behaviour in Spain and finds that terrorist activities increase turnout and have an important impact on vote shares. Montalvo (2011) finds that the 2004 terrorist attacks in Madrid had an important electoral impact, which even determined the winner. Kibris (2011) finds that exposure to PKK terrorism in Turkey increases turnout and the vote share for right-wing parties (tougher against the PKK cause). Getmansky and Zeitzoff (2014), analysing the exposure to rocket attacks from the Gaza Strip in Israel, find that right-wing vote shares are higher in localities that are within the radio of attack. Gallego (2018) finds that guerrilla violence in Colombia reduces turnout; however, paramilitary violence has no effect on participation, but benefits non-traditional third parties. Using evidence from several countries in Europe, Peri et al. (2020) finds that international terror attacks increase vote shares for nationalistic parties.

Related to natural disasters, Gasper and Reeves (2011) find that voters punish governments and officials in charge when there is severe weather damage. Heersink et al. (2017) evaluate the effects of the 1927 Great Mississippi Flood. They find that this natural disaster negatively affected the incumbent's vote share in the next elections. Ramos and Sanz (2020) show that unintended wildfires up to nine months ahead of the elections increased support to the incumbent party's vote share in the following elections. Masiero and Santarossa (2020) also find that harmful earthquakes significantly increase the incumbent mayors' probability of being reelected and their vote share.

The remainder of the paper is organised as follows. Section 2 presents the context of the COVID-19 pandemic in Spain and the 2020 regional Basque elections. Section 3 describes the data employed in the analysis. Section 4 explains the empirical strategy. Section 5 presents the main results, and Section 6 concludes.

2. Institutional setting

2.1. COVID-19 pandemic in Spain

Spain has been one of the earliest and hardest-hit countries by COVID-19.[5] Due to the rapid spread of the infection (see Fig. 2), and after localised actions in hot-spot areas, Spanish Prime Minister Pedro Sánchez announced the implementation of the State of Alarm on March 14th, enforcing one of the strictest lockdowns worldwide.[6]

Indeed, effective on March 15th, individuals could only leave their households for indispensable reasons (e.g. grocery shopping, going to the hospital or buying medicines, taking care of dependents, or work-related obligations).[7] The compliance with the restrictions was controlled by the police and the army and violators could face significant fines.

On April 28th, the government announced a plan to move from confinement to the so-called "new-normal". This plan included four different stages —the fourth one being the least restrictive. Before the move from one stage to another, several factors such as the capacities of the health system, the epidemiological situation, or the compliance with collective protection measures were considered. Finally, on June 21st, after more than three months of very strict measures, the *State of Alarm* was lifted.

2.2. Regional elections in the Basque Country

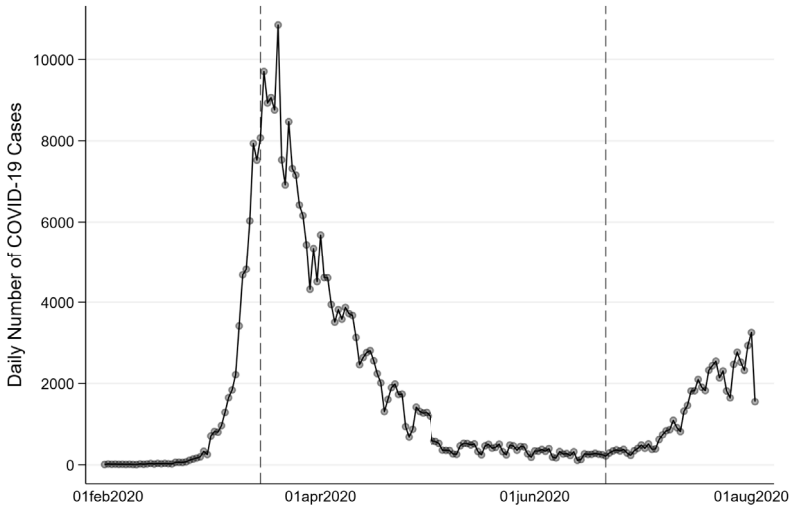
The elections for the Basque Country are mainly regulated by the 1978 Spanish Constitution and the 1979 Statute of Autonomy of

[4] This study was challenged in Tiokhin and Hruschka (2017).

[5] See Felgueroso et al. (2020) for a detailed description of the effects of the COVID-19 on the Spanish economy.

[6] See https://www.ft.com/content/428babc4-66c9-11ea-800d-da70cff6e4d3 (site accessed on 13 September 2020).

[7] Two weeks after the announcement of the *State of Alarm*, however, the central government prohibited all non-essential economic activity.



Notes: This figure shows the total daily number of COVID-19 cases in Spain between January, 31 (when the first case of COVID-19 in Spain was registered) and August, 2. The black dashed lines indicate the beginning (March, 15) and the end (June, 21) of the lockdown measures. The source is from the Centro Nacional de Epidemiología (`https://cnecovid.isciii.es/`).

Fig. 2. COVID-19 Daily Cases in Spain.

the Basque Country. The electoral constituencies correspond to the three Basque provinces: Álava, Bizkaia, and Guipuzkoa. Regardless of the population of the three territories, each constituency elects 25 parliamentarians. If a party achieves at least 38 out of the 75 seats, it obtains an absolute majority.[8]

On 10 February 2020, Iñigo Urkullu, the incumbent of the regional government of the Basque Country, announced that the next regional elections were to be hold on 5 April 2020. However, on 16 March 2020, two days after the national government announced the *State of Alarm*, and the day after the implementation of the national lockdown, it was announced that the vote would be postponed due to the COVID-19 pandemic situation. Indeed, the Basque Country was and still is among the most COVID-19 affected regions. As of September, 6.4% of the total infections at the national level occurred in this region.

The Basque Country finally held the regional elections on 12 July 2020 (three weeks after the *State of Alarm* was lifted) under strict hygiene measures.[9,10] As Fig. 3 shows, while the number of new cases was low at the time of the elections, there was a growing trend. This was mostly due to an outbreak in Ordizia, a municipality situated in Gipuzkoa with around 10,000 individuals.[11,12]

In the 2020 elections, electoral turnout was 50.78%, the lowest participation rate since 1984 and 9.24 points lower than in the previous regional elections in 2016 (see Fig. 4a). The incumbent from the Basque Nationalist Party (PNV), Iñigo Urkullu, was re-elected with 39.06% of the votes and 31 of the 75 seats and obtaining the highest results for the PNV since 1984 (see Fig. 4b).

3. Data

We compile data from several sources. First, we use information on COVID-19 exposure at the municipal level in the Basque Country. Second, we use electoral outcome information (turnout and vote shares) from the six last Basque Country's regional elections. Third, we include information on several socio-economic variables at the municipal level. Our sample includes data on all Basque municipalities for the years 2001, 2005, 2009, 2012, 2016, and 2020.[13]

[8] The allocation of seats to the electoral lists is done through the D'Hondt system.

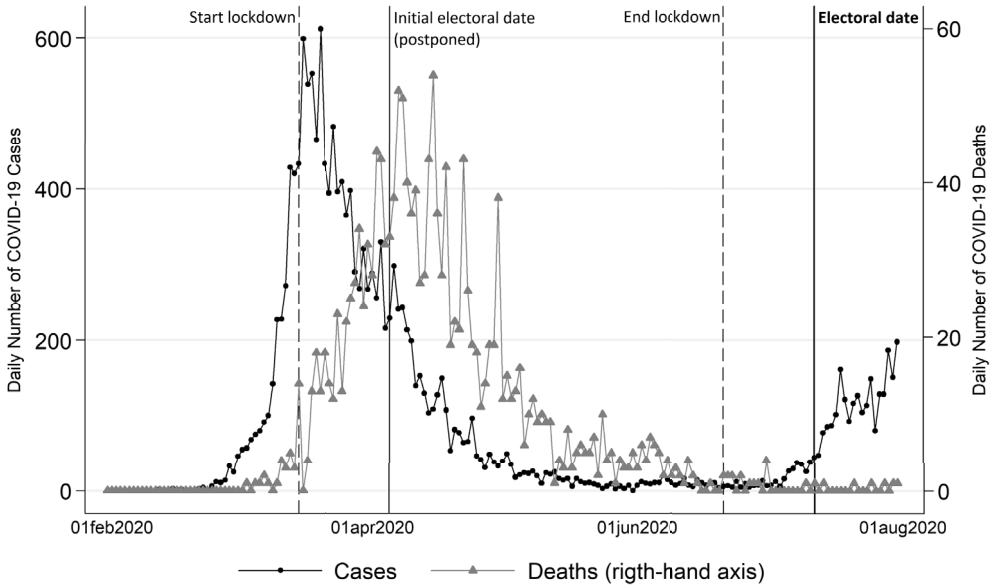
[9] For example, polling centers were cleaned and disinfected before, during, and after the election day, or table members kept a minimum distance of 1,5 m (see https://www.eitb.eus/es/elecciones/autonomicas-vascas/detalle/7361353/coronavirus-covid19-las-medidas-seguridad-elecciones-vascas-2020/(site accessed on 20 December 2020) for a complete list of mandatory measures to keep safety during the election day).

[10] Galicia, another autonomous community located at the northwest of Spain, also held regional elections on 12 July 2020. We do not include Galicia in our analysis as the regional government does not provide data on COVID-19 cases at the municipal level.

[11] In this paper, we show the results including and excluding the municipality of Ordizia.

[12] The Basque Government announced the day before the elections that people infected with the coronavirus will commit a crime against public health (regulated by the law 3996/1995 of the criminal code) if they voted (see https://www.elconfidencial.com/espana/2020-07-11/pais-vasco-votar-contagiados-covid-19-delito-salud-publica_2677843/(site accessed on 20 December 2020)). This prohibition affected around 0.01% of the census. We do not have any further evidence on whether and how this prohibition was actually enforced. Indeed, this rule, announced by the Basque Health Counselor, Nekane Murga, was not published in the Boletín Oficial del País Vasco - BOPV.

[13] If the data is not available at the municipal level for a particular election year, we use the nearest year with available information.



Notes: This figure shows the total daily number of COVID-19 cases and deaths (right-hand side axis) in the Basque Country between January, 31, and August, 2. The solid thin line indicates the original date of the regional elections (April, 5). The solid thick line indicates the actual date of the elections (July, 12). The source is from the Centro Nacional de Epidemiología (`https://cnecovid.isciii.es/`).

Fig. 3. Basque Country COVID-19 Daily Cases & Deaths.

3.1. COVID-19 exposure

To measure exposure to COVID-19, we use official data from the Basque Country government.[14] This source has daily information at the municipal level on (i) the number of infected people with COVID-19, and (ii) the number of deaths caused by COVID-19. To account for population size, we compute the ratios per 100,000 inhabitants.

In our main specification, we distinguish between those municipalities with and without exposure to COVID-19 cases since the outbreak of the pandemic up to the week before the elections.[15] We can see, in Table B1, that there was a lot of variation in exposure to COVID-19. In particular, 31 municipalities (12 percent) did not present any COVID-19 contagion during the studied period. Conditional on having at least one positive COVID-19 case, municipalities were exposed, on average, to 786 cases per 100,000 inhabitants (SD = 742.40).[16] In addition, 54.58 percent of the Basque municipalities recorded zero fatalities caused by COVID-19. For those municipalities where people died from causes related to COVID-19, the average number of deaths was 10.7 per 100,000 inhabitants (S.D. = 9.24).

3.2. Electoral results

To analyse the effect of exposure to COVID-19 on electoral outcomes, we use municipal data on turnout, incumbent parties' vote shares (both at the national and regional levels), and share of vote in favour of nationalist parties in the regional elections held in the Basque Country in the year 2020. To control for pre-trends in voting behaviour, we include data from the 2016, 2012, 2009, 2005, and 2001 regional elections. All this information is made publicly available by the Basque Country government.

We can see in Table B1 that, on average, turnout was 70.92% (SD = 9.82%). The incumbent party at the regional level—PNV—received 47.34% of votes on average (SD = 13.95%). On the other hand, the incumbent party at the national level, PSOE, only received about 9.73% of the votes (SD = 9.14%). The average vote share for nationalist parties across elections was 75.32% (S.D. = 17.62%).[17]

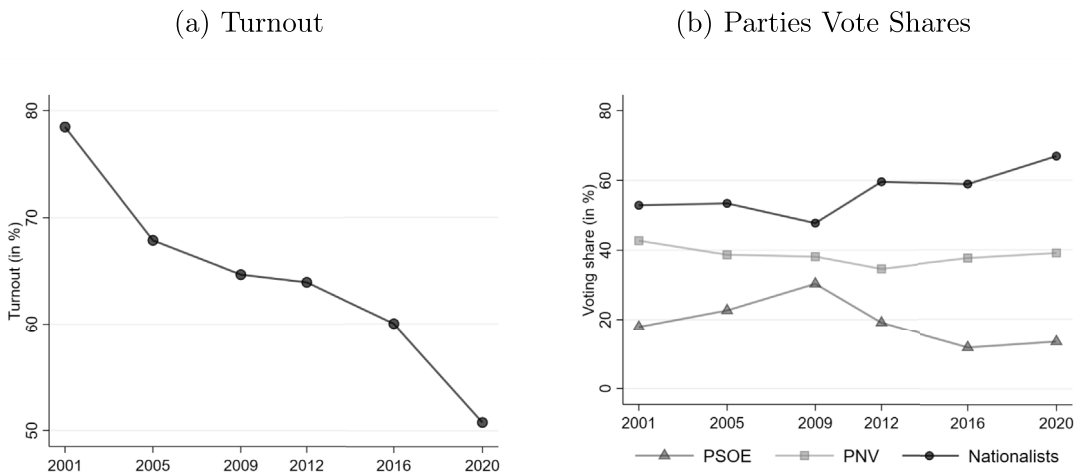
Fig. 4a shows the evolution of participation rates over time at the aggregate level. We can see that turnout was lower in 2020 than in previous years. In fact, the participation rate was the lowest since 1984; although there was already a significant decreasing

[14] See https://www.eitb.eus/es/noticias/sociedad/detalle/7110777/casos-coronavirus-euskadi-pueblo-pueblo-edades/(site accessed on 13 September 2020).

[15] Notice that July 6th was the last official public update until the elections day.

[16] Notice that the descriptive statistics in Table B1 include municipalities with zero COVID-19 cases.

[17] These numbers do not match the official ones because they have not been weighted by population.



Notes: These figures show turnout, PNV vote share, PSOE vote share, and basque nationalists parties vote share in the last six regional elections hold in the Basque Country. Usually, the elections take place each four years, albeit incumbents can move up the dates. Notice that here we are using information from the final outcomes (weighted by population), while in table B1 we do not weight differently large and small municipalities. The source is the Basque government (`https://www.euskadi.eus/elecciones/`).

Fig. 4. Electoral Results.

trend in turnout during the last years. The vote share of the incumbent party in the Basque Country, PNV, increased slightly in the 2020 elections. On the contrary, PSOE's vote share in 2020 was at its lowest point since, at least, the 2001 regional elections. Looking at the vote share for the nationalist parties,[18], we can observe a significant increase in the votes they received in the 2020 elections (see Fig. 4b).

3.3. Other data

In addition, we use information from the Basque Institute of Statistics to control for socio-economic variables available at the municipal level. Namely, we include age distribution, share of inhabitants with tertiary education, and unemployment rates. As we can see in Table B1, the average municipality has 14 percent of their population younger than 16 years, 54 percent of the population ages between 16 and 55 years old, 12 percent between 56 and 65, while the other 20 percent of the population is older than 65 years old. In addition, 14.37 percent of the inhabitants have tertiary education, and the average municipality's unemployment rate is 4.81 percent.

In addition, as we can see in Table B2, municipalities in the control and treatment groups present differences in some of the observable characteristics (e.g. municipalities affected by the COVID-19 are, on average, much larger). However, Panel C shows that the majority of these differences are *canceled out* by the identification strategy.

4. Empirical strategy

The main purpose of this paper is to identify the causal effect of exposure to COVID-19 on voting behaviour and electoral outcomes. In order to isolate this effect of exposure to the infection on the electoral results, we use a difference-in-differences econometric model. We define those municipalities that reported any positive cases of COVID-19 before the election day as treated units. Thus, municipalities with zero cases of COVID-19 are considered to be control units. Our estimation econometric model is given below:

$$Y_{m,p,t} = \alpha + \beta Post_t * COVID19_{m,p,t} + \delta Post_t + \omega COVID19_{m,p,t} + \gamma X_{m,p,t} + \kappa_m + \zeta_p + \psi_t + \epsilon_{m,p,t} \quad (1)$$

where $Y_{m,p,t}$ denotes the turnout and vote share for the incumbent and nationalistic parties in municipality m, province p, and electoral year t. $Post_t$ is an indicator variable that equals one for 2020, the year when there were positive cases of exposure to COVID-19, and 0 otherwise; $COVID19_{m,p,t}$ is an indicator that equals one for municipalities with positive cases of COVID-19, and zero for those municipalities with no exposure to COVID-19 from the outbreak of the pandemic to the week before the elections.

[18] We have considered that a political party falls into the category of "nationalist" if it openly defends or sympathises with Basque nationalism.

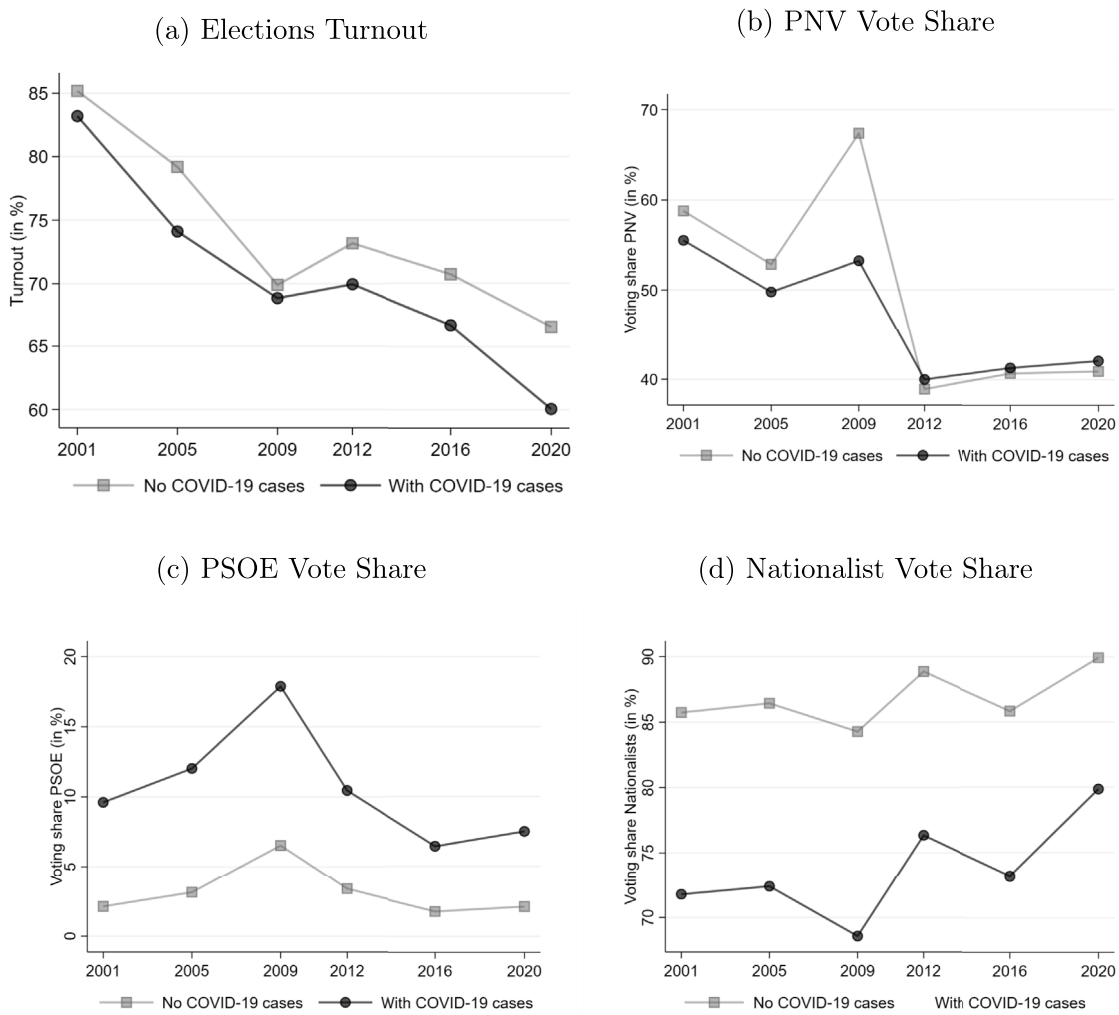


Fig. 5. Turnout and vote shares.

$X_{m,p,t}$ is a vector of socio-economic controls at the municipal level. κ_m, ζ_p, and ψ_t represent municipality, province, and year fixed-effects. We cluster standard errors at the municipal level to address serial correlation concerns and the possibility of heterogeneity in response to the exposure to COVID-19 at the municipal level. Given that we expect bigger municipalities to be more exposed to COVID-19 cases, in some specifications we weight these models by population. In this context, our parameter of interest, β, measures the change in the turnout and vote shares between areas exposed to COVID-19 and those that were not exposed, controlling for previous trends.

To credibly identify the causal effects of COVID-19 on electoral outcomes, it is necessary for both the treated and control municipalities to have exhibited similar trends in turnout and voting behaviour in elections prior to the outbreak of the pandemic. To analyse if the treatment and control group trends are similar, in Fig. 5a–d, we show the electoral outcomes for the elections held in the years 2001, 2005, 2009, 2012, and 2016, our pre-treatment periods, and 2020, our post-treatment period. We can observe that the evolution of the outcomes—although different in levels— seems to follow similar patterns (in the red Appendix C, we explain how the banning of a pro-terrorist Basque-nationalist party had a relevant impact on the 2009 regional elections that might affect our pre-trends analysis).

To formally test for equality of trends, we conduct a common-trends test and an event-study analysis. Our results, in Table C1 and Figs. C1 and C2 in Appendix C, show that the common trends assumption holds for (i) turnout, and (ii) vote shares to the nationalist parties. We observe, however, some differences in voting behaviour towards PSOE and PNV during treatment and control units in the years before the outbreak of the pandemic. In order to account for different pre-existing trends, we follow Wolfers (2006) and

Table 1
DiD results.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Turnout						
Treatment effect	−3.404***	−2.555**	−5.067***	−2.704**	−2.926**	−4.403***
	(1.080)	(1.041)	(1.415)	(1.225)	(1.215)	(1.687)
Panel B: Support to PNV						
Treatment effect	4.904***	2.167	5.202**	1.451	0.920	−0.842
	(1.718)	(1.697)	(2.325)	(1.473)	(1.600)	(1.676)
Panel C: Support to PSOE						
Treatment effect	−2.517***	−1.748***	−1.976***	−0.325	0.183	1.646
	(0.472)	(0.489)	(0.638)	(0.464)	(0.534)	(1.013)
Panel D: Support to Nationalist Parties						
Treatment effect	3.674**	2.531*	4.898***	2.534**	2.192**	2.065*
	(1.445)	(1.396)	(1.298)	(0.988)	(1.022)	(1.164)
Covariates	No	Yes	Yes	No	Yes	Yes
Weights	No	No	Yes	No	No	Yes
Municipality-specific linear trends	No	No	No	Yes	Yes	Yes
Municipalities	251	251	251	251	251	251
Observations	1,504	1,503	1,503	1,504	1,503	1,503

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region, and year fixed effects are included. In table F1 we show that these results are robust to the exclusion of Ordizia.

include municipality-specific linear trends in all specifications.[19]

5. Results

5.1. DiD results

Table 1 presents the main findings from estimating Equation (1). We start by presenting the results of the DiD analysis for (i) turnout (panel A), for (ii) incumbent parties' vote share (panels B and C), and for (iii) the Basque-nationalist parties' vote share (panel D). The table reports six different models: column 1 presents the simplest regression without covariates, column 2 shows the estimation including socio-economic characteristics at the municipal level, and column 3 adds population weights. Columns 4–6 replicate these estimations including municipality-specific linear trends. All regressions include municipality, province, and year-fixed effects.

The results in panel A show that the turnout was, on average, between 2.6 and 5.1 percentage points lower in municipalities with positive cases of COVID-19. This result is in line with the findings of Campante et al. (2020). They use evidence from the congressional and governmental 2014 U.S. elections and find lower participation rates in areas where concerns about Ebola were higher.

Looking at the results in panels B and C, we can see in columns 1–3 that exposure to the pandemic is related to an increase in the vote share for the PNV, while decreasing PSOE's vote share. However, after the inclusion of municipality-specific linear trends, the magnitude of the estimated coefficients become statistically insignificant (see columns 4–6). This means that these results were capturing differences in municipality specific pre-trends.[20]

Finally, panel D shows that the vote share for Basque-nationalist parties was between 2.2 and 4.9 percentage points higher in municipalities exposed to positive cases of COVID-19. This result is consistent with the literature showing that citizens increasingly tend to vote for in-group parties when facing a global threat (see Greenberg et al. (1990) or Peri et al. (2020)).

5.2. Robustness checks

In this section, we look at whether our results are robust to different specifications of treatment and control groups, trying to also understand the differences in responses due to treatment intensity.[21,22] To achieve this, Table 2 re-estimates Equation (1) keeping the control group constant (i.e. municipalities exposed to 0 cases of COVID-19), and defining the treated group as (i) the bottom

[19] Several papers on staggered difference-in-differences such as Goodman-Bacon (2018) and De Chaisemartin and d'Haultfoeuille (2020) show that the two-way fixed effects estimator is a weighted average of treatment effects, and some of the weights can be negative, for example, when the treatment effect is heterogeneous over time. De Chaisemartin and d'Haultfoeuille (2020) develop estimators that valid under those conditions (see de Chaisemartin et al. (2019) for how to implement this in Stata). This does not affect our model because the time of the treatment is the same for all units.

[20] See the results of our event-study in Figs. C1 and C2

[21] We have also conducted an OLS analysis. The results, consistent with our findings in Section 5, can be found in Appendix D.

[22] In addition, our results are also robust to estimating a DiD with continuous treatment, as shown in Table E1.

Table 2
DiD results using the median number of COVID-19 cases.

	Low-Intensity			High-Intensity		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Turnout						
Treatment effect	−1.902	−2.208*	−2.333*	−3.499***	−3.575***	−5.753***
	(1.246)	(1.272)	(1.401)	(1.276)	(1.273)	(1.682)
Panel B: Support to PNV						
Treatment effect	2.092	2.086	1.555	0.800	−0.102	−2.428
	(1.520)	(1.684)	(1.895)	(1.504)	(1.620)	(1.533)
Panel C: Support to PSOE						
Treatment effect	−0.388	0.093	0.767	−0.255	0.239	2.332**
	(0.496)	(0.559)	(1.179)	(0.485)	(0.593)	(1.123)
Panel D: Support to Nationalist Parties						
Treatment effect	2.192**	1.947*	2.760**	2.875***	2.599**	1.544
	(1.044)	(1.021)	(1.245)	(1.022)	(1.081)	(1.174)
Covariates	No	Yes	Yes	No	Yes	Yes
Weights	No	No	Yes	No	No	Yes
Municipality-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	251	251	251	251	251	251
Observations	844	843	843	846	845	845

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects, and municipality-specific linear trends are included.

Table 3
DiD results using the average number of COVID-19 cases.

	Low-Intensity			High-Intensity		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Turnout						
Treatment effect	−2.048	−2.345*	−2.550*	−3.759***	−3.838***	−6.043***
	(1.242)	(1.250)	(1.379)	(1.296)	(1.296)	(1.716)
Panel B: Support to PNV						
Treatment effect	1.770	1.542	0.947	0.923	−0.019	−2.352
	(1.500)	(1.646)	(1.815)	(1.532)	(1.680)	(1.573)
Panel C: Support to PSOE						
Treatment effect	−0.366	0.124	0.621	−0.252	0.280	2.594**
	(0.483)	(0.552)	(1.133)	(0.502)	(0.612)	(1.199)
Panel D: Support to Nationalist Parties						
Treatment effect	2.203**	1.893*	2.565**	3.067***	2.839**	1.577
	(1.016)	(0.997)	(1.242)	(1.059)	(1.112)	(1.214)
Covariates	No	Yes	Yes	No	Yes	Yes
Weights	No	No	Yes	No	No	Yes
Municipality-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	251	251	251	251	251	251
Observations	1,000	999	999	690	689	689

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects, and municipality-specific linear trends are included.

50% of municipalities in terms of exposure to COVID-19 (low-intensity treatment) and (ii) the top 50% of municipalities with more exposure to COVID-19 (high-intensity treatment). The results are consistent with the ones presented in Table 1 and, as expected, the magnitudes are higher for municipalities with more cases of COVID-19. Similar results are found in Table 3, when we use the mean rather than the median to define the low and high intensity groups.[23] Our results are also robust to define the affected and unaffected groups using exposure to COVID-19 deaths instead of cases (see Table 4).

Finally, in Appendix E we aim at accounting for the differences in "real" exposure to the COVID-19 classifying the treatment status by the percentage of affected individuals at the municipality level. On average, municipalities had 0.7% of their citizens infected. In order to compare municipalities with similar incidence rates, we define several treatment and control groups (in particular, we test four different models, in which we compare municipalities with less and more of 0.25%, 0.5%, 0.75% and 1% of their population affected). As we can observe in Fig. E1, these results are in line with the findings in Table 1.

Overall, the results in Table 1 are robust to these alternative specifications. In the next section, we discuss a potential mechanism

[23] The average and median number of COVID-19 cases used to define these two groups are calculated excluding the municipalities that presented zero cases. These results are similar if we calculate the mean and median cases of COVID-19 including the municipalities where there were no confirmed cases of COVID-19.

Table 4
DiD results using death of COVID-19 cases.

	(1)	(2)	(3)
Panel A: Turnout			
Treatment effect	−2.431***	−2.496***	−2.779***
	(0.566)	(0.574)	(0.827)
Panel B: Support to PNV			
Treatment effect	−0.438	−1.570**	−2.464***
	(0.654)	(0.752)	(0.810)
Panel C: Support to PSOE			
Treatment effect	−0.997***	−0.189	0.858
	(0.279)	(0.344)	(0.666)
Panel D: Support to Nationalist Parties			
Treatment effect	1.714***	1.157*	0.131
	(0.545)	(0.594)	(0.636)
Covariates	No	Yes	Yes
Weights	No	No	Yes
Municipality-specific linear trends	Yes	Yes	Yes
Municipalities	251	251	251
Observations	1,504	1,503	1,503

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects, as well as municipality-specific linear trends are included.

that may explain the drop in participation rates.

5.3. Fear as a mechanism

When thinking about the mechanisms explaining our results, we consider fear to in-person voting due the actual or perceived thread of contagion as the potential driver of the drop in participation rates. Indeed, according to a Morning Consult poll, 66% of U.S. citizens consider in-person voting as risky activity.[24]

For the Basque elections, there are some facts that suggest that perceived fear, rather than the actual possibility of contagion, could have motivated the drop in participation rates. First, at the time of the elections more than 90% of the municipalities had zero active cases of COVID-19. Thus, it is very unlikely that the real threat of exposure to COVID-19 at the time of the election drove the results. Second, the correlation between the turnout and active cases the week before 12 July 2020 is very low, as can be seen in Fig. 6.

In order to empirically test for this, Table 5 shows the results of estimating Equation (1) dropping all municipalities with active cases of COVID-19 the week before the elections.[25] By doing this, we eliminate those municipalities where fear to contagion at the polling place is a realistic threat. We can see that the findings in Table 1 are robust to eliminating the affected municipalities, and the magnitude of the coefficients are quite stable. This result supports the idea that perceived fear (rather than the actual threat of getting infected) may have been the driving mechanism for a low participation rate.

This explanation is consistent with the work results in Adam-Troian et al. (2020). They show, using evidence of the first round of 2020 French municipal elections, that areas where the perceived threat of COVID-19 was higher presented a change in their voting behaviour. Interestingly, they do not find that the real COVID-19 threat had any effect on vote shares.

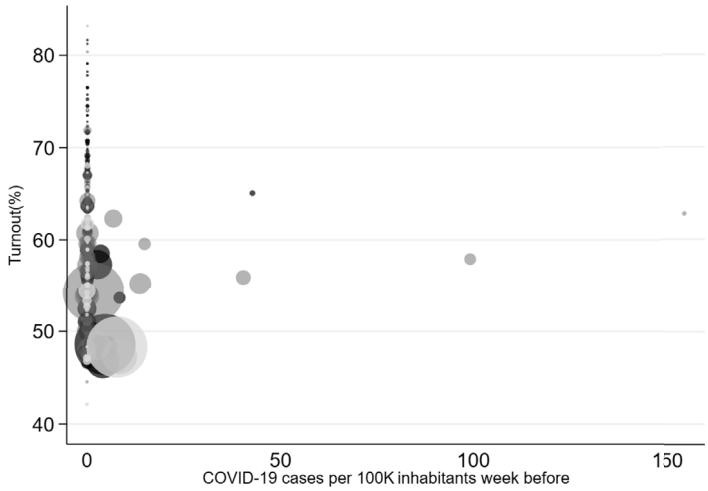
Another concern could be that the effect we find is mechanic. This is, we observe a reduction in participation because those who are or were sick decided not to vote. In order to shed light on this, we estimate the following econometric model:

$$Votes_{m,p,t} = \alpha + \beta Post_t * Cases_{m,p,t} + \delta Post_t + \omega Cases_{m,p,t} + \gamma X_{m,p,t} + \kappa_m + \zeta_p + \psi_t + \epsilon_{m,p,t} \quad (2)$$

where $Votes_{m,p,t}$ is the number of votes in municipality m, province p and year t, and $Cases_{m,p,t}$ measures the accumulated number of cases at the municipal level until the week before the elections.

The results show that for each additional active cases of COVID-19, 10 persons less vote.[26] This suggests that our results are not mechanical.

[24] See https://morningconsult.com/2020/03/20/voting-options-poll-coronavirus/(site accessed on 15 September 2020).
[25] Only 19 municipalities had active cases of COVID-19 in the week before the elections.
[26] These results are available upon request.



Notes: Figure 6 shows the turnout (y-axis), and the active number of COVID-19 cases the week before the elections at the municipal level (x-axis). The size of the markers represents the population of the municipality. The municipalities represented in black, dark grey and light grey belong to the provinces of Bizkaia, Gipuzkoa, and Alava respectively.

Fig. 6. Recent cases of COVID-19 and Turnout.

Table 5
DiD results. Turnout.

	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	−3.182***	−2.351**	−3.227***	−2.512**	−2.759**	−2.918**
	(1.083)	(1.044)	(1.060)	(1.229)	(1.213)	(1.381)
Covariates	No	Yes	Yes	No	Yes	Yes
Weights	No	No	Yes	No	Yes	Yes
Municipality-specific linear trends	No	No	No	Yes	Yes	Yes
Municipalities	232	232	232	232	232	232
Observations	1,390	1,389	1,389	1,390	1,389	1,389

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects are included in all specifications.

6. Conclusions

The COVID-19 pandemic has been the largest, most unexpected health shock in a century. Some countries registered large drops in GDP and huge increases in unemployment rates. Fatalities experienced a large rise as well. Managing an epidemic not only requires tackling the health and economic consequences of the outbreak, but also its social and political dimensions. While public health and economics were the most affected fields at the beginning of the pandemic, the consequences may be extended to some other aspects, such as electoral outcomes.

In this paper, we study the extent to which exposure to COVID-19 affects voting behaviour and electoral outcomes. To do so, we use evidence from the regional elections that were held in the Basque Country on 12 July 2020, and exploit the variation in exposure to COVID-19 cases across municipalities.

Our main results indicate that turnout was between 2.6 and 5.1 percentage points lower in those municipalities where there was a positive number of COVID-19 cases. Our results also show that exposure to COVID-19 increased the vote shares to the nationalist parties from 2.1 to 4.9 percentage points. These results are robust to different specifications of the model and the treatment status.

We discuss perceived fear of COVID-19 as a potential mechanism for our results. At the time of the elections, there were almost no active cases of COVID-19 in the Basque Country. In addition, as Fig. 6 and Table 5 show, the effects we observe cannot be driven by municipalities in the affected group recently experiencing higher exposure to the virus. This interpretation is consistent with the findings in Campante et al. (2020).

These results may be considered by policymakers when designing forthcoming electoral campaigns, as voters from different ideologies may present different perceptions towards the pandemic and its consequences. For example, Calvillo et al. (2020) or Simonov et al. (2020) find that republican voters perceive themselves as being less personally vulnerable to the virus and the virus as being less severe. This type of sentiment, together with variation in the exposure to COVID-19 across regions, may end up having

an important role in the forthcoming electoral processes.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

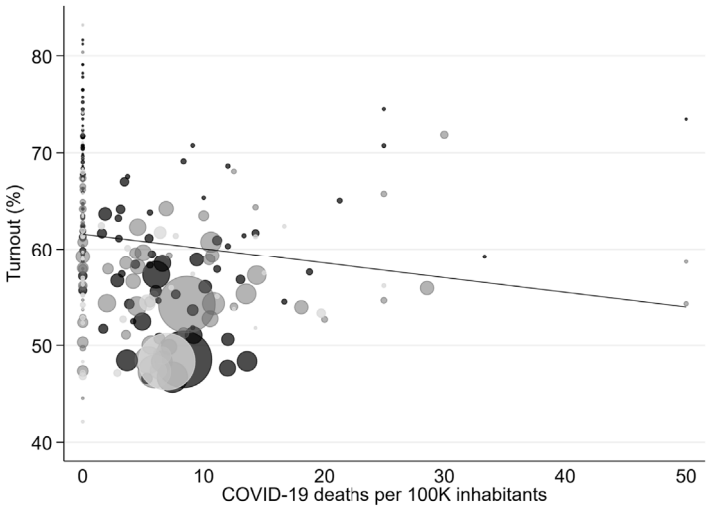
Data availability

Data will be made available on request.

Appendix

This appendix provides additional tables and figures that are also discussed in the paper.

Appendix A COVID-19 Deaths and Turnout



Notes: Figure A1 shows the correlation between the exposure to COVID-19 deaths and the turnout at the municipal level. Notice that the size of the markers represents the population of the municipality. The municipalities represented in black, dark grey, and light grey belong to the provinces of Bizkaia, Gipuzkoa, and Alava respectively. The black line represents the fitted values of a linear regression model. We can observe that participation rates were lower in those municipalities where more people died for causes related to the COVID-19 pandemic.

Fig. A1 COVID-19 Deaths and Turnout.

Appendix B Descriptive Statistics

Table B1 presents the descriptive statistics.

Table B1
Descriptive Statistics.

	Mean	St. Dev.	Min.	Max.	Obs.
Panel A: Electoral Data					
Turnout (%)	70.92	9.82	38.85	98.63	1504
Vote share PNV (%)	47.34	13.95	2.60	87.5	1504
Vote share PSOE (%)	9.73	9.14	0	46.47	1504
Vote share Nationalism (%)	75.32	17.62	23.42	100	1504
Panel B: COVID-19					
Cases per 100k inhabitants	689.20	741.63	0	7983.19	251
Deaths per 100k inhabitants	4.86	8.19	0	50	251
Panel C: Socio-economic Characteristics					
Age distribution					
<16 (%)	13.81	3.27	3.19	28.48	1504
16-25 (%)	8.88	2.18	0	17.67	1504
26-35 (%)	12.76	3.52	2.85	26.46	1504
36-45 (%)	16.58	2.61	4.62	30.17	1504
46-55 (%)	15.46	2.53	5.25	27.27	1504
56-65 (%)	12.44	2.55	3.64	22.65	1504
>65 (%)	20.06	4.67	8.17	41.97	1504
Education					
Tertiary educ. (%)	14.37	5.38	3.61	37.87	1504
Unemployment					
Unemployment rate (%)	4.81	3.74	0	22.44	1503

Notes: This table presents the summary statistics for the 251 municipalities in the Basque Country. We use data from the election year. If data is not available at the municipal level for that year, we use information from the nearest available period.

Table B2 presents the descriptive statistics by group.

Table B2
Descriptive Statistics by Treatment Status

	A: Pre-treatment			B: Post-treatment			C: DiD
	Treated	Control	Diff	Treated	Control	Diff	Diff
Population	9699.5	322.3	9377.2***	9898.0	337.5	9560.5	183.3
			(2584.0)			(5832.7)	(6339.1)
High educ.	14.5	12.0	2.5***	15.6	14.3	1.3	−1.2
			(0.5)			(1.0)	(1.1)
<16	13.6	13.5	0.1	15.0	15.2	−0.2	−0.3
			(0.3)			(0.6)	(0.7)
16-25	9.1	7.7	1.4***	8.8	8.8	0.0	−1.4***
			(0.2)			(0.4)	(0.4)
26-35	13.8	11.7	2.1***	9.0	8.7	0.3	−1.8**
			(0.3)			(0.3)	(0.6)
36-45	16.9	16.7	0.2	15.3	13.2	2.1***	1.9***
			(0.2)			(0.5)	(0.5)
46-55	15.1	15.7	−0.6**	16.7	17.1	−0.4	0.21
			(0.2)			(0.4)	(0.5)
56-65	12.0	12.1	−0.1	14.4	15.7	−1.3***	−1.2**
			(0.2)			(0.5)	(0.5)
>65	19.5	22.5	−3.0***	21.0	21.4	−0.4	2.6***
			(0.4)			(0.8)	(1.0)
Unemp.	4.8	2.8	2.0***	6.5	4.2	2.3***	0.3
			(0.3)			(0.4)	(0.8)
Obs.	1098	155		220	31		

Notes: This table presents the summary statistics for the 251 municipalities in the Basque Country divided by treatment status and period. ***, ** and * indicate 1%, 5% and 10% significance levels respectively.

Appendix C Common trends

In order to test the common-trends assumption for our main empirical strategy, we estimate the following econometric model with data from the election years 2001–2016:

$$Y_{m,p,t} = \alpha + \beta Period_t * COVID19_{m,p,t} + \delta Period_t + \omega COVID19_{m,p,t} + \gamma X_{m,p,t} + \kappa_m + \zeta_p + \psi_t + \epsilon_{m,p,t} \quad (3)$$

where $Y_{m,p,t}$ denotes the turnout and vote shares for the incumbent and nationalistic parties[27] in municipality m, province p and time t. $Period_t$ is a variable that takes the value 1 for the election year 2001, 2 for the election year 2005, 3 for the election year 2009, 4 for the election year 2012, and 5 for the election year 2016; $COVID19_{m,p,t}$ is an indicator that equals one for municipalities with positive cases of COVID-19 in 2020, and zero for those municipalities with no exposure to COVID-19 from the outbreak of the pandemic to the week before the elections. $X_{m,p,t}$ is a vector of socio-economic controls at the municipal level. κ_m, ζ_p, and ψ_t represent municipality, province, and year fixed-effects, and $\epsilon_{m,p,t}$ is the error term, clustered at the municipal level. In some specifications we weight these models by population. In this context, β, measures the change in the turnout and vote shares between areas exposed to COVID-19 and those that were not exposed in the years were COVID-19 was not present. Therefore, we should expect β to be statistically indistinguishable from zero.

Table C1 presents the results. We can see that for electoral turnout and vote share for the nationalistic parties there is no evidence against the common trends assumption. When looking at vote share for PNV, we find inconsistent results, with some specifications reporting small and imprecise positive effects, while others present large and statistically significant effects. For the PSOE's vote shares, we find a negative and statistically significant effect, which goes against the main assumption for the validity of the DiD estimation (i.e. that electoral outcomes evolved similarly before COVID in those municipalities affected by the pandemic and those that were not affected).

Table C1
Common Trends

	(1)	(2)	(3)
Panel A: Turnout			
Treatment effect	−0.232	−0.071	−0.296
	(0.329)	(0.318)	(0.297)
Panel B: Support to PNV			
Treatment effect	1.172*	0.382	1.683*
	(0.689)	(0.696)	(0.972)
Panel C: Support to PSOE			
Treatment effect	−0.737***	−0.681***	−0.655**
	(0.101)	(0.121)	(0.260)
Panel D: Support to Nationalist Parties			
Treatment effect	0.384	0.112	0.507
	(0.426)	(0.413)	(0.511)
Covariates	No	Yes	Yes
Weights	No	No	Yes
Municipalities	251	251	251
Observations	1,253	1,252	1,252

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects are included in all specifications.

[27] We have considered that a political party falls into the category of "nationalist" if it openly defends or sympathises with Basque nationalism. In the 2001 elections, three nationalist parties met this criterion: PNV, Euskal Herritarrok (EH), and Askatasuna. Askatasuna was declared illegal on 5 February 2002. EH was also banned in 2003 by the Supreme Court of Spain on the grounds that it sympathised with the terrorist organisation ETA. In the 2005 regional elections, the Communist Party of the Basque Homelands (which had been inactive since 2002) announced that it would assume the program of the banned radical parties. In addition, Aralar (another Basque political party) contested the regional elections and entered the Basque Parliament with only one seat. Therefore, in 2005, there were another three nationalist parties that met our criteria to be considered nationalists: PNV, Communist Party of the Basque Homelands, and Aralar. Given that the Communist Party of the Basque Homelands was outlawed by the Spanish Supreme Court in 2008, it was unable to participate in the 2009 elections. In fact, in 2009, PNV, Eusko Alkartasuna, and Aralar were the nationalist parties that ran in the elections. From 2012 until 2020, the Basque Country exhibited political stability, and only PNV and Bildu are considered nationalist parties.

In addition to the common trends test, we conduct an event-study that also allows us to study the existence of differences in electoral trends before the pandemic outbreak. Specifically, we estimate the following econometric model:

$$Y_{m,p,t} = \sum_{t=2001, t\neq 2016}^{2020} \beta_t COVID19_{m,p,t} * 1\{2001, \ldots, 2020\} + \gamma X_{m,p,t} + \kappa_m + \zeta_p + \psi_t + \epsilon_{m,p,t} \quad (4)$$

Fig. C1 presents the results, which document a lack of flat trends in some periods, being the years 2005 and 2009 specially problematic, while the years 2001 and 2012 do seem to present a similar behaviour in electoral outcomes than 2016.[28]

These findings are not surprising and are consistent with previous research (see Arenas (2020)). The Basque Country is a region with a strong nationalist sentiment and a complicated political context.[29]

From 1958 to 2011, a paramilitary and terrorist group called ETA engaged in a campaign of assassinations and kidnappings with the main aim of achieving the independence of the Basque Country.[30] They also created a political branch, named Batasuna, which was outlawed in 2003.[31,32] After the prohibition, Batasuna's members tried to enter existing parties in order to take part in the next elections. Some of them moved into the Communist Party of the Basque Homelands and the Basque Nationalist Action (ANV). The first one was banned in 2007, and ANV was banned in 2008. This created a lot of tension in the Basque Country, with numerous demonstrations taking place in Bilbao to protest the Court's decision.

This fact was reflected in the 2009 regional elections, in which null votes exceeded 100,000. This represents 2410% more null votes than in previous elections. Finally, in 2011, Batasuna grouped different parties and organisations into one single party called "Bildu" (unity) in order to participate in the 2011 local elections.[33] After some legal disputes, the Spanish Constitutional Court allowed Bildu to contest the 2011 local elections, as it had become a fully legalised party. Since the legalisation of Bildu, and after the disappearance of ETA, from 2012 on, the Basque Country has shown more political stability.

In Fig. C2, we plot the event study without the estimated coefficients for 2005 and 2009. This is, we omit those years in which certain political parties were banned to participate in the local elections by the Spanish Courts because such court decision created distortions in turnout and voting (see Arenas (2020)). Before the COVID-19 outbreak, turnout and support to nationalist parties exhibit a flat trend. After the outbreak of the pandemic, however, we can observe a decrease in the turnout in affected municipalities, while we also find an increase in support for nationalist parties. In line with the main results, observed deviations in the support to PNV and PSOE might come from pre-treatment trends.

[28] This unstable situation described above, specially present in 2009, can also be clearly observed in Fig. 5a–d.

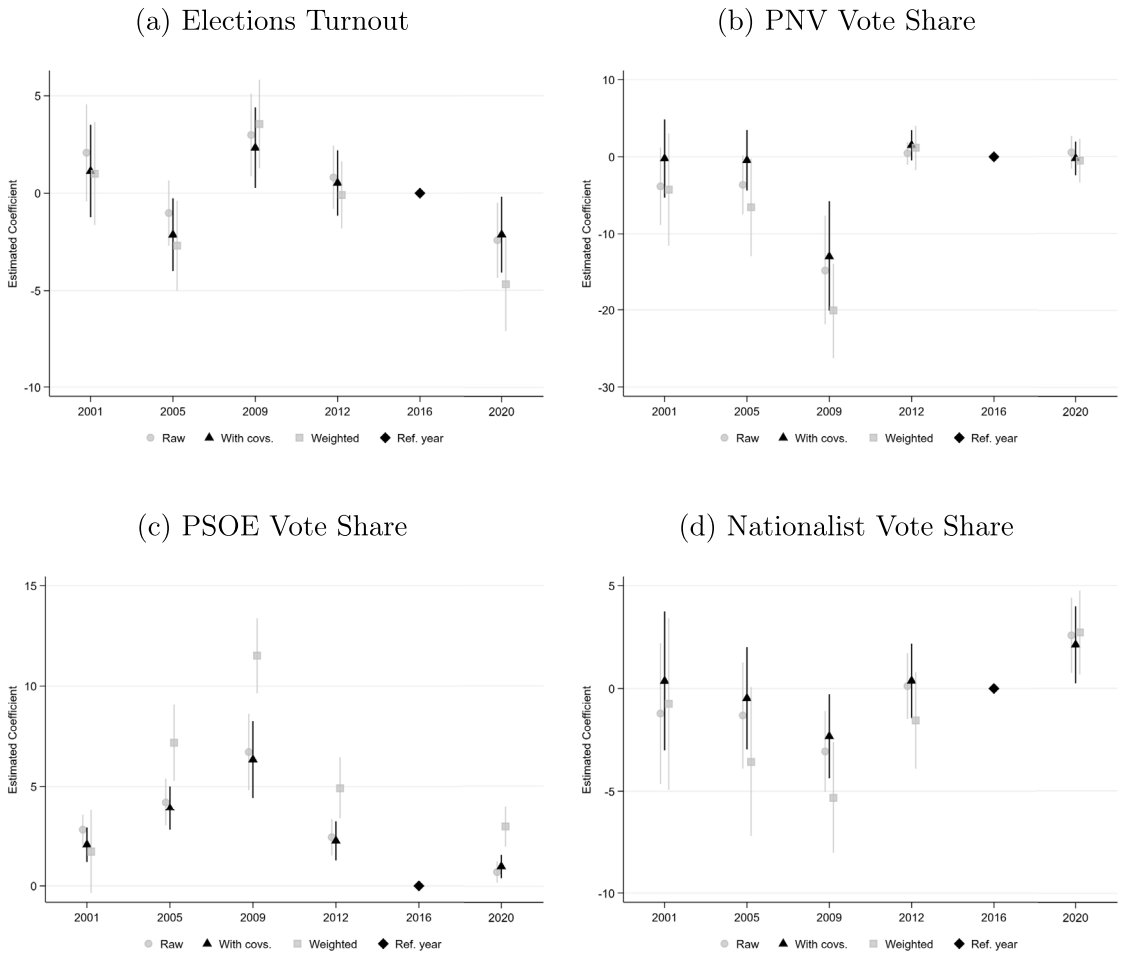
[29] Notice that since the first democratic elections after Franco's dictatorship, the PNV has always won and nationalist parties usually receive more than 50% of the vote share.

[30] The consequences of violence in the Basque Country, provoked by the terrorist organisation, ETA, on voting behaviour were analysed in De la Calle and Sánchez-Cuenca (2013). They estimate that killings by ETA had an electoral cost that was assumed by its political branch, Batasuna.

[31] Organic Law 6/2002 of Political Parties.

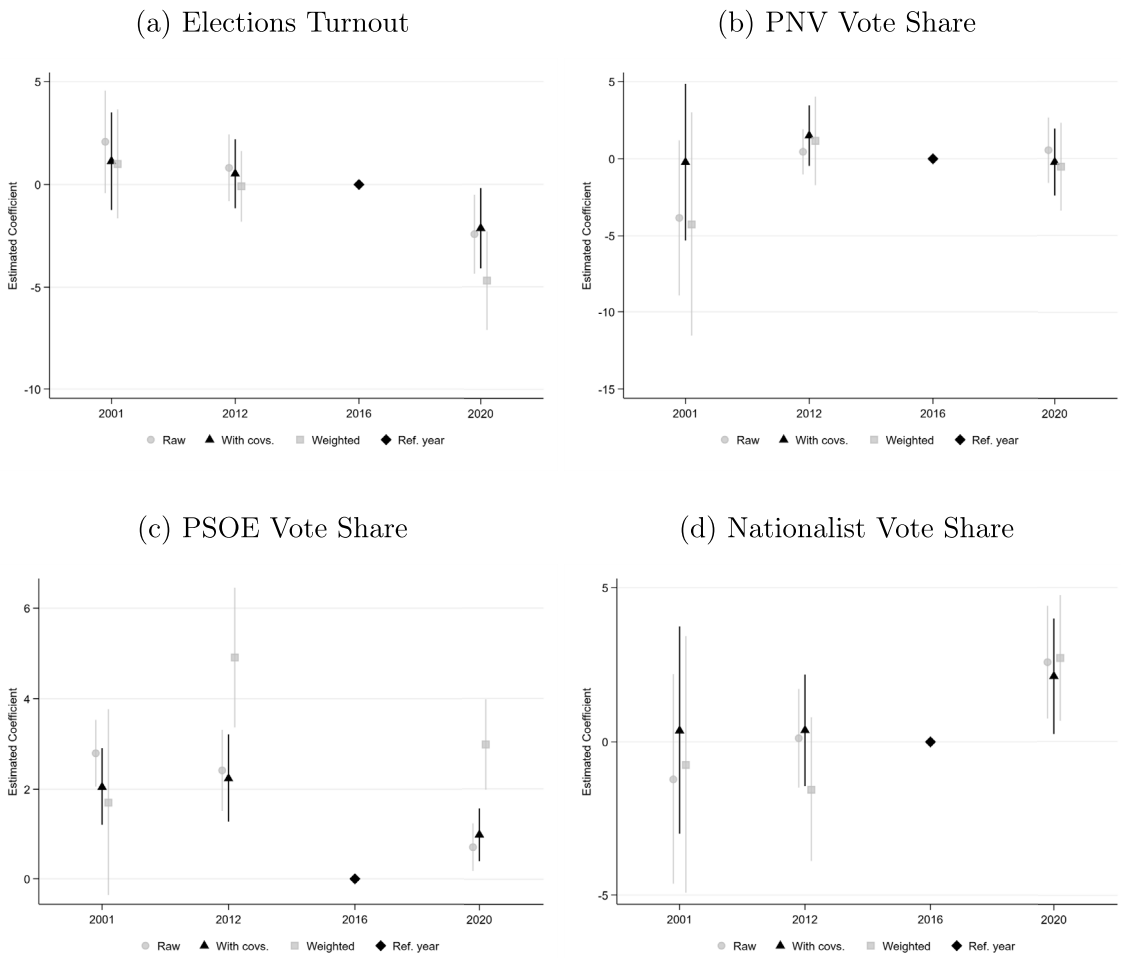
[32] Before its ban, Batasuna obtained between 20 and 25% of the vote share in the regional Basque elections (see Arenas (2020)).

[33] For the first time, Batasuna decided to explicitly reject ETA's violence, with the aim of being allowed back into the political arena (see Arenas (2020)).



Notes: Figure C1 shows the results of the event-study for turnout, PNV, PSOE and nationalist vote shares. The reference year is 2016. The first set of regressions do not include either covariates or weights. The second set adds covariates, and the third one incorporates both covariates and population weights. Robust standard errors are clustered at the municipal level. Municipality, region, and year fixed effects are included in all models.

Fig. C1 Event Study Results.



Notes: Figure C2 shows the results of the event-study for turnout, PNV, PSOE and nationalists excluding the elections in which some parties were outlawed. 2016 is the reference year. The first set of regressions do not include either covariates or weights. The second set adds covariates, and the third one incorporates both covariates and weights. Robust standard errors are clustered at the municipal level. Municipality, region, and year fixed effects are included in all specifications.

Fig. C2 Event Study Results (without 2005 and 2009).

Appendix D OLS results

In this section, we present the results of estimating the following OLS model:[34]

$$Y_{m,p,t} = \alpha + \beta_1 Rate_{m,p,t} + \beta_2 Rate^2_{m,p,t} + \gamma X_{m,p,t} + \delta Post_t + \kappa_m + \zeta_p + \psi_t + \epsilon_{m,p,t} \tag{5}$$

where $Y_{m,p,t}$ measures (i) turnout in municipality m in province p during the elections held in year t, (ii) vote shares in these elections to the incumbent parties at the regional and national levels, and (iii) vote shares to nationalist parties. $Rate_{m,p,t}$ measures the number of confirmed cases in municipality m in province p in year t from the outbreak of the pandemic to the week before the elections.[35] $Rate^2_{m,p,t}$ also controls for the potential non-linear effects of the exposure to COVID-19 on the outcomes. We include socio-economic characteristics at the municipal level ($X_{m,p,t}$), and a categorical variable that takes the value 1 for the elections hold in 2020, and zero otherwise ($Post_t$). In addition, we include municipality(κ_m), province (ζ_p), and year(ψ_t) fixed-effects. We cluster standard errors at the municipal level to address serial correlation concerns and the possibility of heterogeneity in response to the exposure to COVID-19 at the municipal level. In this scenario, our parameters of interest are β_1, which measures the relation between being exposed to

[34] The problem with this OLS specification is that those municipalities with and without exposure to COVID-19 may be systematically different. For example, there might be unobserved factors simultaneously affecting the probability of being exposed to COVID-19 and voting behaviour.

[35] This observation only takes positive values on the year 2020.

COVID-19 cases and electoral outcomes, and β_2, which captures potential non-linear effects in this relation.

Table D1 presents the results of estimating Equation (5). Column 1 estimates the coefficients for the parameters β_1 and β_2 without covariates, column 2 controls for socio-economic characteristics at the municipal level, and column 3 adds population weights. All specifications include municipality, province, and year fixed-effects.

The results in columns 1 and 2 show that an increase by one in the number of cases per 100,000 inhabitants is associated, on average, with a reduction in the participation of 0.003 percentage points (s.e. = 0.001). To better understand this magnitude, we can also interpret the estimates as follows: one extra case of COVID-19 over 100 people reduces participation around 3 percentage points. Looking at column 3, the result for the weighted model indicates that being exposed to one additional COVID-19 case over 100 inhabitants is associated with an average decrease in turnout of 6 percentage points (s.e. = 0.002). In all specifications, we can see that the non-linear effects are negligible in magnitude. Panel B of Table D1 reports the vote share to the regional incumbent party, the PNV. The estimated coefficients show that being exposed to an additional case of COVID-19 over 100 people is associated to an increase in the support for the regional government of around 5 percentage points. In the case of vote share for the national incumbent party (PSOE), panel C shows that an additional case of COVID-19 over 100 people is associated to a decrease in the support for the national government of around 1 percentage points. This result, however, is non-statistically significant when population weights are included. Finally, in panel D, we look at whether being exposed to COVID-19 affects the vote share for Basque-nationalist parties. We can see that being exposed to an additional case of COVID-19 over 100 inhabitants increases the vote share for nationalist parties by 3 percentage points.

Table D1
OLS Results

	(1)	(2)	(3)
Panel A: Turnout			
Treatment intensity	−0.003***	−0.003***	−0.006***
	(0.001)	(0.001)	(0.002)
Treatment nonlinearity	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)
Panel B: Support to PNV			
Treatment intensity	0.007***	0.005***	0.006***
	(0.001)	(0.001)	(0.002)
Treatment nonlinearity	−0.000***	−0.000***	−0.000**
	(0.000)	(0.000)	(0.000)
Panel C: Support to PSOE			
Treatment intensity	−0.002***	−0.001***	−0.001
	(0.001)	(0.000)	(0.001)
Treatment nonlinearity	0.000***	0.000***	0.000
	(0.000)	(0.000)	(0.000)
Panel D: Support to Nationalist Parties			
Treatment intensity	0.004***	0.003***	0.004***
	(0.001)	(0.001)	(0.001)
Treatment nonlinearity	−0.000***	−0.000**	−0.000**
	(0.000)	(0.000)	(0.000)
Covariates	No	Yes	Yes
Weights	No	No	Yes
Municipalities	251	251	251
Observations	1,504	1,503	1,503

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects are included in all specifications. The results are robust to the exclusion of the municipality of Ordizia (results available upon request).

Appendix E Additional Robustness Checks

DiD - continuous treatment

We have also estimated the following continuous DiD:

$$Y_{m,p,t} = \alpha + \beta Post_t * Rate_{m,p,t} + \delta Post_t + \omega Rate_{m,p,t} + \gamma X_{m,p,t} + \kappa_m + \zeta_p + \psi_t + \epsilon_{m,p,t} \tag{6}$$

where $Rate_{m,p,t}$ is the number of COVID-19 infected individuals per 100,000 inhabitants. The results, in Table E1, show that one additional COVID-19 infection over 100 people reduces the participation between 1 and 4 percentage points.

Table E1
Continuous DiD

	(1)	(2)	(3)
Panel A: Turnout			
Treatment effect	−0.001**	−0.001**	−0.003***
	(0.000)	(0.000)	(0.001)
Panel B: Support to PNV			
Treatment effect	−0.000	−0.000	−0.001
	(0.000)	(0.000)	(0.002)
Panel C: Support to PSOE			
Treatment effect	−0.000	−0.000	0.002***
	(0.000)	(0.000)	(0.001)
Panel D: Support to Nationalist Parties			
Treatment effect	0.001***	0.001***	−0.000
	(0.000)	(0.000)	(0.001)
Covariates	No	Yes	Yes
Weights	No	No	Yes
Municipality-specific linear trends	Yes	Yes	Yes
Municipalities	251	251	251
Observations	1,504	1,503	1,503

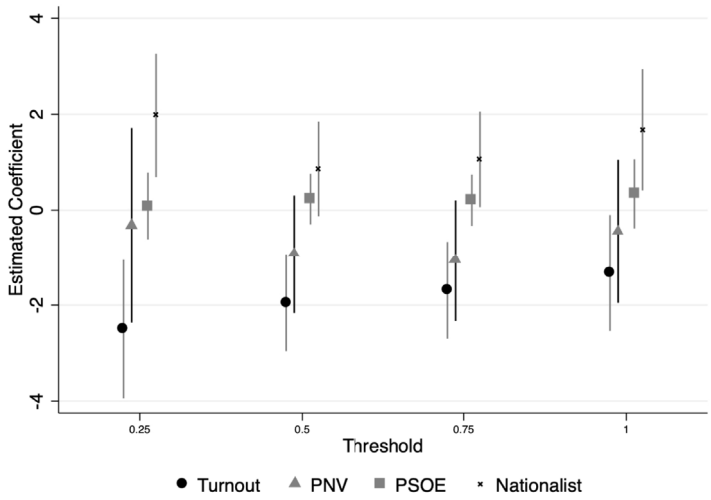
Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively. Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects, and municipality-specific linear trends are included.

Difference-in-differences with different treatment thresholds

A potential concern is related to the fact that the treatment group has municipalities with very different rates of COVID-19 infected population. For example, if there are two municipalities with 10 positive cases of COVID-19, both of them make it into the treatment group independently of their population size. In other words, our categorization defines municipalities as treated, even when the share of the affected population is fairly close to zero.

In order to compare between municipalities in which the actual prevalence rates are similar, we propose the following alternative categorization. We compute the share of infected population, considering not only the number of infected individuals but the municipality size. To avoid an arbitrary pick of the treatment status, we define as treated those municipalities whose share of the infected population is over a set of thresholds (0.25, 0.5, 0.75, and 1%), being the control group those municipalities with rates of infected below the indicated levels.[36] Fig. E1 shows the results of estimating equation (1) using these different treatment status. As we can see, the estimated coefficients are quite stable through the different thresholds and in line with the results across the paper.

[36] The average of the infected population is 0.7%, the median 0,5%, and the maximum 7%, which corresponds to the municipality of Samaniego.



Notes: Figure E1 shows the results of estimating Equation 5 using as treatment groups those municipalities with more than 0.25, 0.5, 0.75 and 1% of the population infected. Municipality, region, year fixed effects, municipality-specific linear trends, and covariates are included in the models.

Fig. E1 Differences in difference with share of treated.

Appendix F Main results excluding Ordizia

Table F1 shows that results presented in Table 1 are not driven by the increase in COVID-19 cases in the municipality of Ordizia during the week of the elections.

Table F1
DiD Results

	(1)	(2)	(3)
Panel A: Turnout			
Treatment effect	−2.695**	−2.916**	−4.407***
	(1.226)	(1.215)	(1.686)
Panel B: Support to PNV			
Treatment effect	1.470	0.942	−0.836
	(1.473)	(1.602)	(1.674)
Panel C: Support to PSOE			
Treatment effect	−0.313	0.192	1.663
	(0.464)	(0.537)	(1.027)
Panel D: Support to Nationalist Parties			
Treatment effect	2.526**	2.187**	2.051*
	(0.989)	(1.023)	(1.168)
Covariates	No	Yes	Yes
Weights	No	No	Yes
Municipality-specific linear trends	Yes	Yes	Yes
Municipalities	250	250	250
Observations	1,498	1,497	1,497

Notes: ***, ** and * indicate 1%, 5% and 10% significance levels respectively.Robust standard errors clustered at the municipal level are presented in parentheses. Municipality, region and year fixed effects are included.

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