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Voting under threat: evidence from the 2020 French local elections

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Abstract
We study how Covid-related risk affected participation across the French territory in the March 2020 local elections. We document that participation went down disproportionately in towns exposed to higher Covid-19 risk. Towns that lean towards the far-right saw a stronger drop in turnout, in particular in the vicinity of clusters. We argue that these patterns are partly a result of risk perceptions, and not only of political considerations. We use data on the drop in cinema admissions in early March 2020 and show that these went down more around infection clusters, especially in areas with substantial vote for the far-right. Taken together, our findings suggest that the fear of Covid-19 may have been on average more prevalent among far-right voters, contributing to a drop in their electoral participation.

Key words: electoral turnout, local elections, Covid-19, far-right
JEL codes: D72

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1 Introduction

The first round of the French local elections of 2020 took place on March 14, when the country was just starting to grasp the severity of the covid-19 pandemic. All political parties expressed their support for maintaining the election but many voters were worried, or plain scared by the health situation[1]. The nationwide turnout was 44.75%, 18.8 percentage points lower than the previous election in 2014. The covid crisis is remarkable in that it made voting potentially life threatening, for oneself and for the others. While common in many countries, such a situation is unknown for most voters in advanced democracies. The timing of the French local election also makes it of particular interest. Data on infection at the time were unreliable, the disease transmission was poorly understood and protective equipment (hydroalcoholic gels, face masks) was in short supply. These circumstances provide a unique opportunity to study the factors that made voters respond to an unusual increase in the risk of voting.

Our paper first establishes that towns more exposed to factors of risk linked to the pandemic saw a larger drop in turnout. We construct a group of towns identified as clusters in the media before the election and of towns connected to these clusters, which we measure by commuting patterns (or alternatively by geographic proximity). Together, these form our group of relatively more exposed towns given the information at the time. We show that the drop in turnout between 2014 and 2020 was significantly higher in exposed towns, in particular if they also had a high proportion of people aged 60 or above, a known risk factor at the time. We also show that, conditional on our covariates, exposed towns had a similar evolution of turnout in previous local elections as the rest of the country, whether their population is old or not. Taken together, this suggests that voters did respond to factors influencing the known risk of voting. We confirm the risk interpretation by additionally looking at the evolution of cinema admissions between early March 2019 and early March 2020. We show that admissions went down more in cinemas close to identified clusters. Cinema admissions are independent of political considerations but should be correlated with the perceived risk of going out. The similarity of our results for electoral turnout and cinema admissions points to perceived risk as the main driver of the shift in the former.

We also document the determinant role of political affinity in explaining the subjective perception of the pandemic risk. We find that towns in which Marine Le Pen, the far-right candidate, came first in the 2017 presidential election (short: "far-right towns") saw a stronger decrease in turnout, in particular among exposed towns. This

[1] In a survey conducted on the days after the elections, the CEVIPOF showed that 57% percent of those who did not vote stated the coronavirus as a reason for abstaining.

result holds conditional on observable measures of the risk and on a number of socio-demographic factors at the town level[2]. It is robust across specifications and sub-samples, and cannot be explained by specific pre-trends in participation in far-right towns. One possibility is that far-right voters in France exhibit on average a higher degree of risk aversion, and respond more to the same increase in risk than other towns. Another is that they were more prone to lose faith in the political system due to the covid-crisis, or were less attached to voting and responded more to a given change in risk perception. To further disentangle the channels, we show that cinema admissions went down more in cinemas close to identified clusters, particularly so if the surrounding towns were far-right towns. We take this as evidence that the subjective perception of risk can at least partly explain the differential response of far-right towns in terms of turnout.

Our analysis relates to the very recent but quickly expanding literature on the effect of the Covid-19 pandemic on electoral participation for example in regional election in Spain (Fernandez-Navia et al., 2021) or presidential elections in Malawi (Chirwa et al., 2021). A contemporaneous paper by Noury et al. (2021) also examines how participation in the French municipal elections of 2020 reacted to the risk of catching the disease. While we differ slightly in our sample and implementation, we confirm that participation went down more in towns that were close to identified clusters and particularly so for towns with a high share of older voters. We however differ from these studies in two major ways. First, we we emphasize the determinant role of far-right voters in shaping these patterns. Second, using cinema admissions, we document that this may be driven by differences in perceived risk rather than political considerations.

Our results also speak to the literature linking political preferences to the attitude towards risk or fear. Campante et al. (2020) show that the fear of the Ebola outbreak before the 2014 mid-term elections in the U.S. did affect voter turnout and that Republican candidates were strategically exploiting this fear. Makridis and Rothwell (2020) find that, in the United States, Republicans are less likely to social distance, to self-isolate, and to wear masks. Adam-Troian et al. (2020) argue that the fear of the virus made voters turn to more conservative parties in the French municipal elections, while Fernandez-Navia et al. (2021) that voters turned more to nationalistic parties in the Basque country in July 2020. We also relate to the literature in political psychology showing how the need to manage uncertainty or threats correlates with conservatism or extremism (see e.g. Jost et al. (2007)).

[2]Little was known about risk factors beyond age at the time and the few health-related characteristics that were mentioned, such as obesity, diabetes or cancer are unlikely to be related with political affiliation once we control for socio-demographic factors.

To our knowledge, three other papers look specifically at the context of French local elections in 2020. Two of them study the health impact of the elections, in terms of the spread of the disease (Cassan and Sangnier, 2020) and of risk for politicians (Bach et al., 2021). Giommoni and Loumeau (2020) on the other hand show that strong lock-down restrictions in the spring of 2020 favoured incumbent mayors in the second round of the election.

Our paper is structured as follows. Section 2 gives some background about the French municipal elections and the health situation in March 2020,and presents our hypotheses. Section 3 studies the causal impact of the pandemic on turnout while Section 4 turns to the mechanisms, with a focus on cinema admissions. Section 5 concludes.

2 Background and hypothesis

2.1 The French local elections and the epidemic perception early March 2020

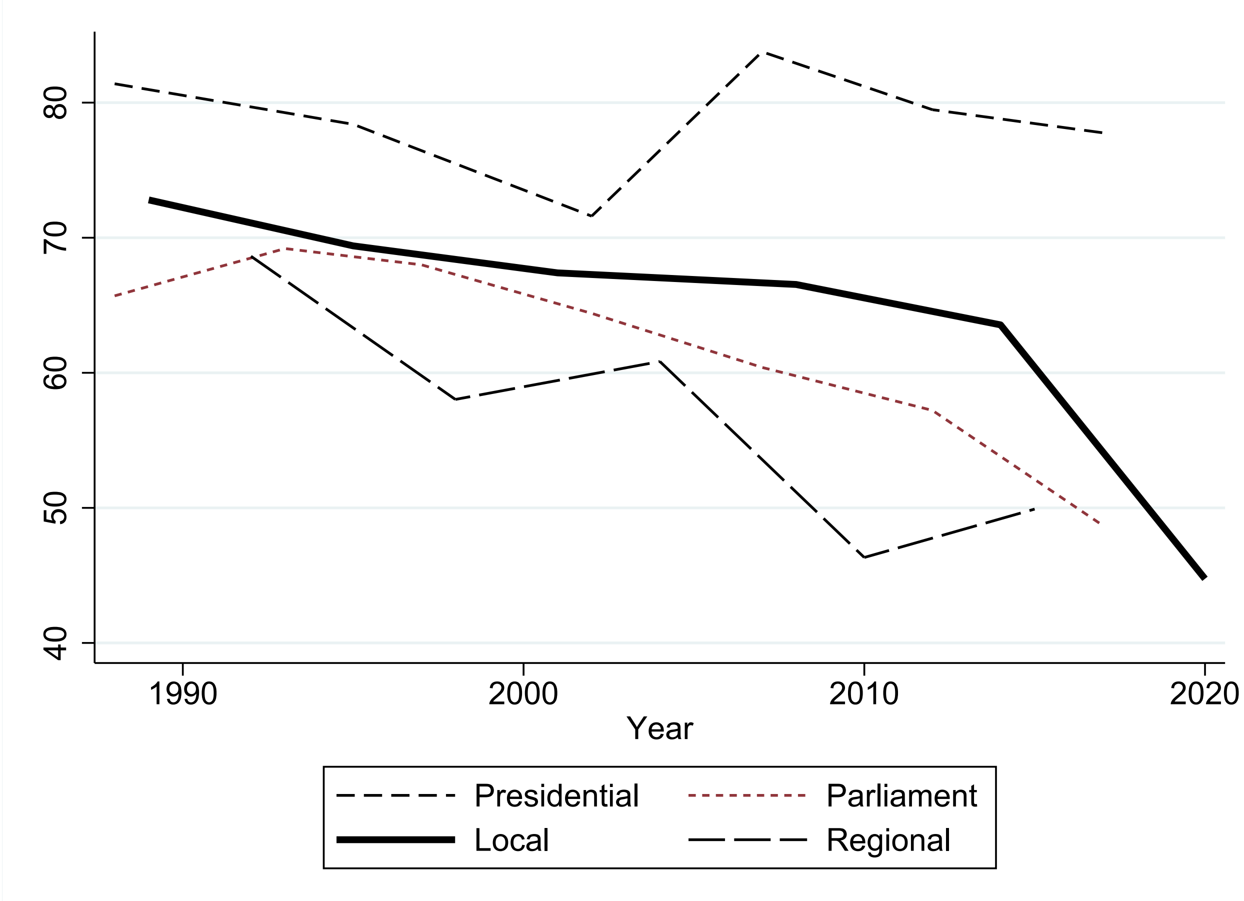
The French "municipales" elections take place every 6 years in March. Registered voters elect the members of the city council by direct universal suffrage[3]. The city council is in charge of the general affairs of the city. Specifically, it votes the city budget, it administers the city public services and infrastructures (parks, roads, schools), it promotes the city economic activity, and it subsidizes local charities. French voters are relatively attached to local elections. As shown in Figure 1, while nationwide participation to local elections gradually decreased between 1990 and 2014, it is systematically above participation at parliament or regional elections.[4]

In 2020, the elections took place under unusual circumstances. While Covid-19 emerged in China in December 2019 before spreading in Europe in February 2020, by early March the centre of the epidemic had shifted from China to Europe where the rise in cases was steep. On February 26th 2020, the first French Covid patient - a teacher working in Crépy-en-Valois (Oise) - died in an hospital in Paris. The virus was then found in different French towns. There was no official comprehensive list of towns constituting core clusters and the official data at the time on the exact number of cases locally were extremely scarce and unreliable. The French media however extensively

[3]The rules to elect the members of the city council differ slightly between towns above and below 1,000 inhabitants. Each voter can either choose a list with the possibility to remove some candidates in small towns, while he picks one of the registered lists as it is in towns of at least 1,000 inhabitants.

[4]Participation level is computed as casts voters over registered voters as typically done in official French figures.

Figure 1: Turnout in the first round of French election



covered the emergence of new cases and is the most accurate representation of the information that the French population had at the time. On March 6 2020, France Bleu -a public regional radio channel which has strong ties with local administration - provided a list of all core clusters at the time on its website based on its investigation on the ground. We find in this list: four towns in Oise area (Creil, Crépy-en-Valois, Vaumoise, Lamorlaye, Lagny-le-sec), three towns in Brittany (Auray, Cra'ch, Carnac), Ajaccio in Corsica, la Balme de Sillingy in Savoy, Méry-sur-Oise in the North of Paris and Mulhouse in Alsace. Official decrees by local authorities forbade public gatherings in most of these clusters early March. In parallel, the acute health situation in Northern Italy was making headlines. Cumulative Covid-19 deaths in French close neighbour went from 34 to 1,441 between March 1st and March 14th. Italy progressively put in place a nationwide lock-down between March 8 and 11. All this participated in raising concerns in the French population. According to Google Trends, the week prior to the elections (March 8-14 2020) was the week with the second highest share of searches for the word “Coronavirus” in France in the year 2020, just after the week of March 15-21.

This situation was unprecedented and the decision to maintain elections in that context was not straightforward. While, the French government considered the possibility of cancelling the elections early March, the French President Emmanuel Macron announced on March 12 that the elections would be maintained. During his television speech on that day, he stressed that the government was taking all the measures to ensure the continuity of the political, economic and social life of the nation. A set of measures were put in place by the government to limit the spread of the virus and protect the members of the polling stations and the voters. First by reorganizing the polling stations to limit proximity, proceeding to visual checks of IDs and cleaning the polling station. Posters also informed voters of the good gestures to adopt: wash their hands when entering and leaving the polling station, avoid any physical contact, distant themselves from other voters. Masks were then not recommended and only reserved to people at high risk.

On the day of the elections, the French Health Authority, *Santé Publique France*, reported 6,378 confirmed cases in France, out of which 285 in intensive care and 161 deaths. It also observed a doubling of the number of declared cases between March 13 and March 15 and emphasized that these numbers may be underestimated, especially in the regions that were more affected. On March 16, the day after the first round of the elections, Emmanuel Macron announced a national lock-down effective at noon the next day.

2.2 Hypothesis

Going to the polling station has long been formulated as the outcome of a rational decision (Downs (1957)) where individuals weigh the costs C of casting a ballot (the time it takes among others) and the expected reward of voting. Classically, this reward depends on the outcome of the election, and can be expressed as the probability that the voter is pivotal (p) times the benefit (B) of having his preferred party elected, where B depends on the stakes of the election. Generating positive participation with p close to zero, rests on the existence of additional benefits of the act of voting (D), which do not depend on the outcome of the election (Riker and Ordeshook (1968), Feddersen and Sandroni (2006)), such as a sense of duty. Individuals vote whenever the net benefit of voting $R = pB + D - C$ is positive. A large body of empirical evidence points to such rational behaviour among voters in different contexts[5].

[5] Blais (2006) among many others.

Cost-benefits of voting with Covid-19 The most obvious and direct effect of the pandemic on the trade-off faced by voters is to raise the expected costs of voting. The pandemic raises the costs of voting from C to $C + \tilde{\pi}\tilde{\chi}$, with $\tilde{\pi}$ the perceived probability of catching the disease when voting by an individual, and $\tilde{\chi}$ the perceived utility cost of catching the virus[6]. $\tilde{\pi}$ depends on the local probability π of catching the disease based on information available at the time (e.g. distance to identified clusters), and $\tilde{\chi}$ on objective measures of the severity of the disease χ (influenced by age among others). We assume that individuals map local exposure measures into perceived risk according to $\tilde{\pi}\tilde{\chi} = \pi\chi + \alpha$, where α captures the degree of pessimism, or fear, of the individual[7]. The extent to which $\tilde{\pi}\tilde{\chi}$ decreases turnout depends on the correlation between these costs and the other determinants of voting. If those who feel most threatened by Covid typically have high or low D, their impact on turnout will be moderate as they would vote or not vote regardless of circumstances. The mapping from increased risk to lower turnout thus depends on the sensitivity of the voting decision to a given increase in perceived risk.

Beyond the direct effect on the risk of voting, the pandemic may also have an impact on other determinants of turnout. The Covid crisis may change the stakes of the election, thereby affecting B. Voters may for example be more inclined to vote if they believe that the mayor has a central role to play in such exceptional circumstances, an unlikely effect in the French institutional context[8]. The covid crisis may also affect D, the benefits of the act of voting. Unlike in elections held under a terrorist threat (see Gardeazabal (2010) and Kibris (2011)), in which voters defy terrorists by going to the polling station (a rise in D), such a reaction is unlikely when the enemy is a virus. Some voters may see the pandemic as a deep failure of a system in which they do not want to participate any more (drop in D).

Political heterogeneity A recent literature has pointed to the crucial role of political affiliation in shaping the perception of the pandemic (Allcott et al. (2020), Milosh et al. (2020)). Makridis and Rothwell (2020) find that, in the United States, Republicans are less likely to social distance, to self-isolate, and to wear masks. Interestingly, they show that age becomes insignificant in predicting the fear of contracting the virus after they control for political affiliation. Such differences correlate well with the di-

[6] An alternative explanation, which is observationally equivalent in our data, is that voters have a utility cost of being potential spreaders of the virus, a less egoistic interpretation.

[7] We are agnostic about the underlying determinants of α, which may also stem among others from different (social) media exposure, different trust in science, etc. see Dryhurst et al. (2020)

[8] In principle, the covid pandemic can also affect the perceived probability of being pivotal if voters anticipate the drop in participation. While this may be at play in very small towns, it is unlikely to have any real quantitative importance.

vergence in political discourse about Covid-19 between Republicans and Democrats in the United States. In France, all major parties consider the pandemic a serious issue, justifying extraordinary measures. There are however good reasons to think that voters with different political orientations may react differently. Political preferences may correlate with risk perceptions. Jost et al. (2017) documents a significant relationship between subjective perceptions of threats and conservatism. There is a long standing view in political psychology that emotions such as anxiety or anger contribute to the populist vote (see e.g. Vasilopoulos et al. (2018) and the references therein). If far right voters are typically more afraid of external threats such as the coronavirus (higher α) or feel more anger at the system (drop in D), this may contribute to decreasing their participation disproportionately. In its survey conducted the days after the election, the CEVIPOF asked a representative panel of the French adult population their feelings about the Covid crisis. Fear was mentioned across the political spectrum, and anger was particularly marked among voters who identify with the Rassemblement National (far right). When asked how serious the consequences on health would be, 58% of those close to Rassemblement National answered “very serious”, by far the largest proportion. They however had the lowest proportion stating “rather serious”, potentially reflecting a substantial variation of attitudes among supporters of the Rassemblement National.

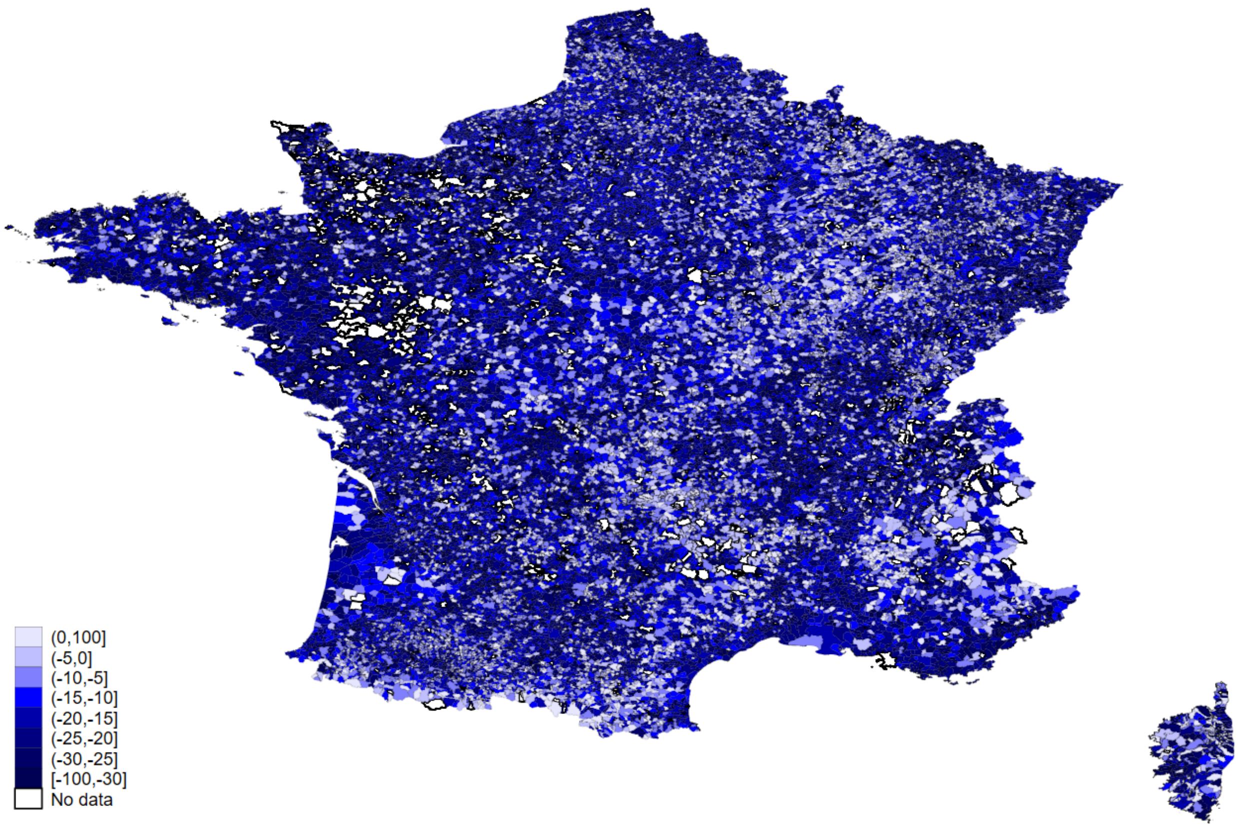
3 Data

This section presents the main variables used in our empirical analysis.

Turnout Our main outcome of interest is people’s willingness to go to the polling stations. Thus, rather than excluding blanks and invalid votes from the definition of turnout, as it is usually done in official figures in France, we define turnout as the number of cast, blank and invalid votes on the number of registered voters. To compute it, we use election results from the French *Ministère de l’Intérieur* at the town-level for local and parliamentary elections.[9] Figure 2 depicts the change in turnout between the first rounds of the 2020 and 2014 local elections, our main outcome variable ($\Delta Turnout$). We restrict our sample to 33,682 French towns for which there was no change in administrative boundaries between 2014 and 2020 (merger, fusion, split, change of code etc...). Turnout at the 2020 local elections appears generally low compared to the 2014 local elections and is significantly different across municipalities.

[9]For Paris, Lyon, Marseille, we use election results at the level of an electoral district. Paris has 18 electoral districts, Lyon 9 and Marseille 8.

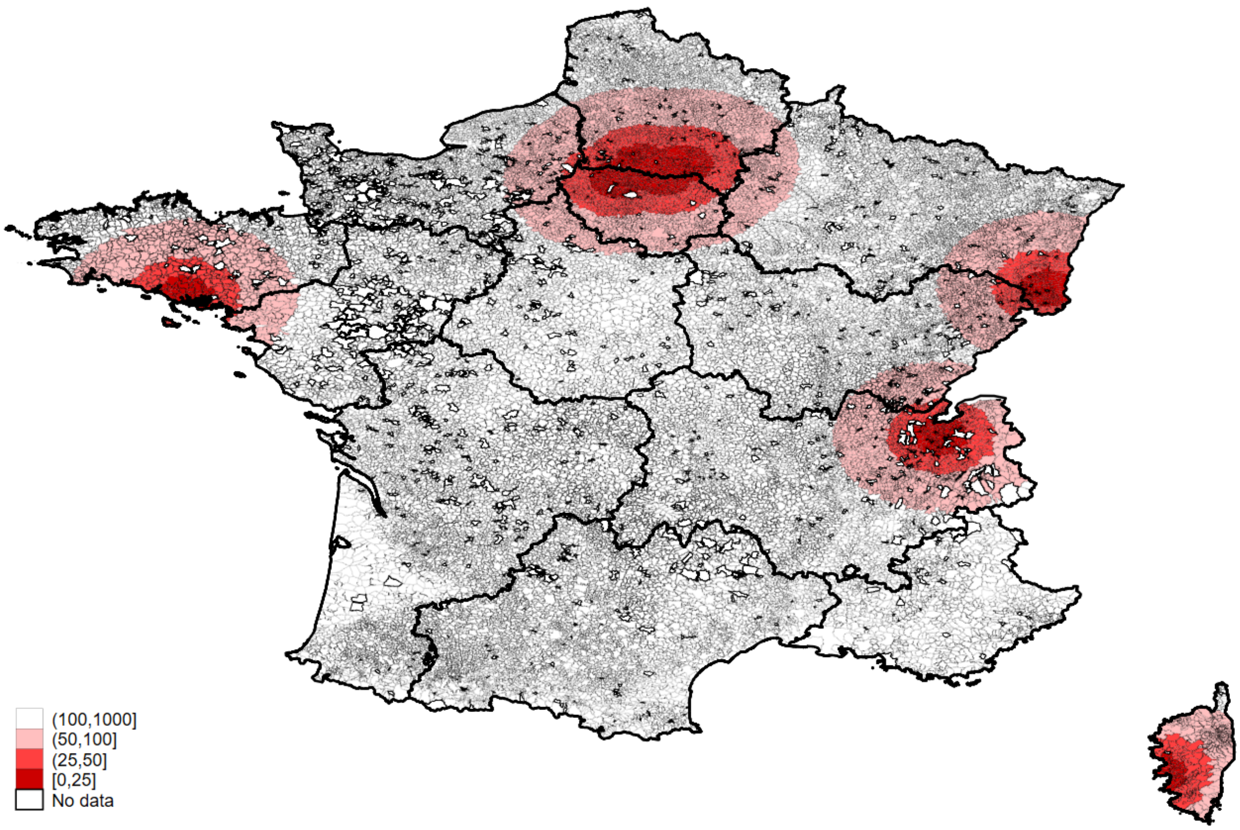
Figure 2: Change in Turnout between 2020 and 2014 local elections in French towns



Clusters The list of core clusters provided by the radio channel *France Bleu* is the basis for our definition of most exposed places, so-called clusters. The core clusters on that list are in line with the coverage of major French media: the radio channel *France Info* and the newspaper *Le Monde* covered the emergence of cases in each of these towns between February 29 and March 6. We display the location of these core clusters in Figure 3. These towns are located predominantly in the North of France, out of which six are located in North of Paris, and are on average bigger that other French towns. In these clusters, the drop in turnout was higher on average than in other towns in France. To that initial list of core clusters, we add towns which have close interactions with the core clusters as it was known to be the main transmission channel. Commuting flows are a good proxy for the likelihood of close interactions between the population of two towns. The French National Statistical Institute (INSEE) reports annual commuting flows between towns in France for flows of at least 100 individuals in its dataset *Flux mobilité domicile-travail*. We consider a town to be close to a core cluster if the INSEE reports flows between this town and a core cluster. In total, we have 142 clusters.

We also provide two alternative definitions of clusters - *Prox25* and *Prox50* - where

Figure 3: Core Clusters in early March 2020



we use distance rather than commuting flows as proxy for the likelihood of close interactions. While these alternative definitions may be less precise measures of interactions, they capture other types of links beyond commuting and are not subject to a minimum threshold, which may be problematic for small towns. We calculate geographical distances between towns using the great-circle distance, based on the geographical coordinates from the public postal service *La Poste*. *Prox25* is a dummy variable which takes value 1 if a town is located at less than 25 km from a core cluster (smaller circle in Figure 3). *Prox50* is a dummy variable which takes value 1 if a town is located at less than 50 km from a core cluster (first and second concentric circles in Figure 3). The number of exposed towns is significantly higher according to these definitions: there are respectively 1,125 and 3,080 clusters in *Prox25* and *Prox50*. As shown in Table 1, which provides the mean and the standard deviation of the main demographic characteristics of the towns for each of our definitions, the towns in these groups are similar in all dimensions except for size.

Table 1: Descriptive Statistics: Comparison between different groups

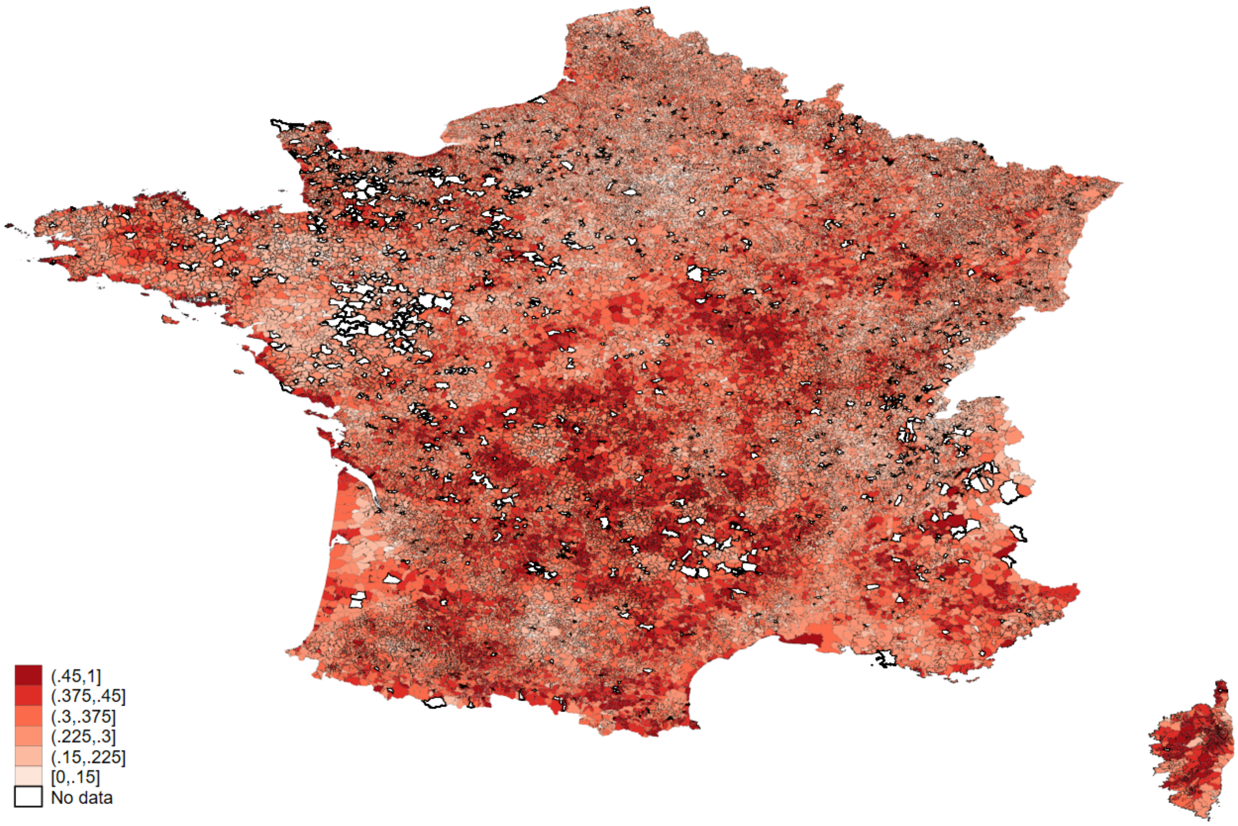
	(1) *Clusters*	(2) *Prox25*	(3) *Prox50*	(4) *Others*
Log(population)	8.472	7.232	6.922	6.144
	(1.347)	(1.548)	(1.566)	(1.322)
Share 60+	0.248	0.223	0.237	0.291
	(0.0527)	(0.0715)	(0.0762)	(0.0862)
Share Farmers	0.00401	0.00785	0.0120	0.0357
	(0.00548)	(0.0157)	(0.0286)	(0.0547)
Share Artisans	0.0353	0.0395	0.0400	0.0433
	(0.0149)	(0.0264)	(0.0299)	(0.0382)
Share Senior Executives	0.0876	0.102	0.0911	0.0537
	(0.0511)	(0.0638)	(0.0661)	(0.0480)
Share Intermediate Occupations	0.161	0.175	0.163	0.129
	(0.0310)	(0.0512)	(0.0571)	(0.0664)
Share Employees	0.170	0.168	0.163	0.153
	(0.0314)	(0.0513)	(0.0527)	(0.0634)
Share Other Occupations	0.542	0.508	0.531	0.585
	(0.0619)	(0.0891)	(0.0980)	(0.107)
Observations	142	1,125	3,080	30,592

Notes: The table gives the mean and the standard deviation in parenthesis of demographic characteristics for town subsets. Column (1) presents descriptive statistics for the 142 clusters, column (2) for the 1,125 towns in a 25-km range of core clusters, column (3) for the 3,080 towns in a 50-km range of core clusters, and column (4) for the remaining towns.

Demographic characteristics All variables on demographic characteristics are taken from the 2016 Population Census, which is the latest that took place in France. Along with the population of a town and the share of the population by occupation[10], we use the share of people above 60 as a proxy for objective risk denoted Share 60+. Figure 4 shows this share as measured in the 2016 Census.

[10] Occupations are grouped in 6 broad categories: Farmers, Artisans, Senior Executives, Intermediate occupations, Employees, and Others occupations.

Figure 4: Share of 60 years and older in 2016 in French towns



Political preferences We proxy political preferences for each French town by the party of the candidate who collected the most votes during the first round of the 2017 Presidential elections. We exclude for this part of the analysis towns where there was more than one leading candidate in the first round of the elections[11]. The results of the elections at the municipality level are taken from the French *Ministère de l'Intérieur*. Figure 5 reveals significant heterogeneity in political affiliation across towns and regions in France.

Table 2 shows descriptive statistics for the main variables.

[11] We pool two candidates of the left, B. Hamon, the candidate of the Socialist party (center-left) and J-L. Mélenchon (far-left) as the former came first only in a few towns.

Figure 5: Top Candidate in the first round of the 2017 Presidential Elections

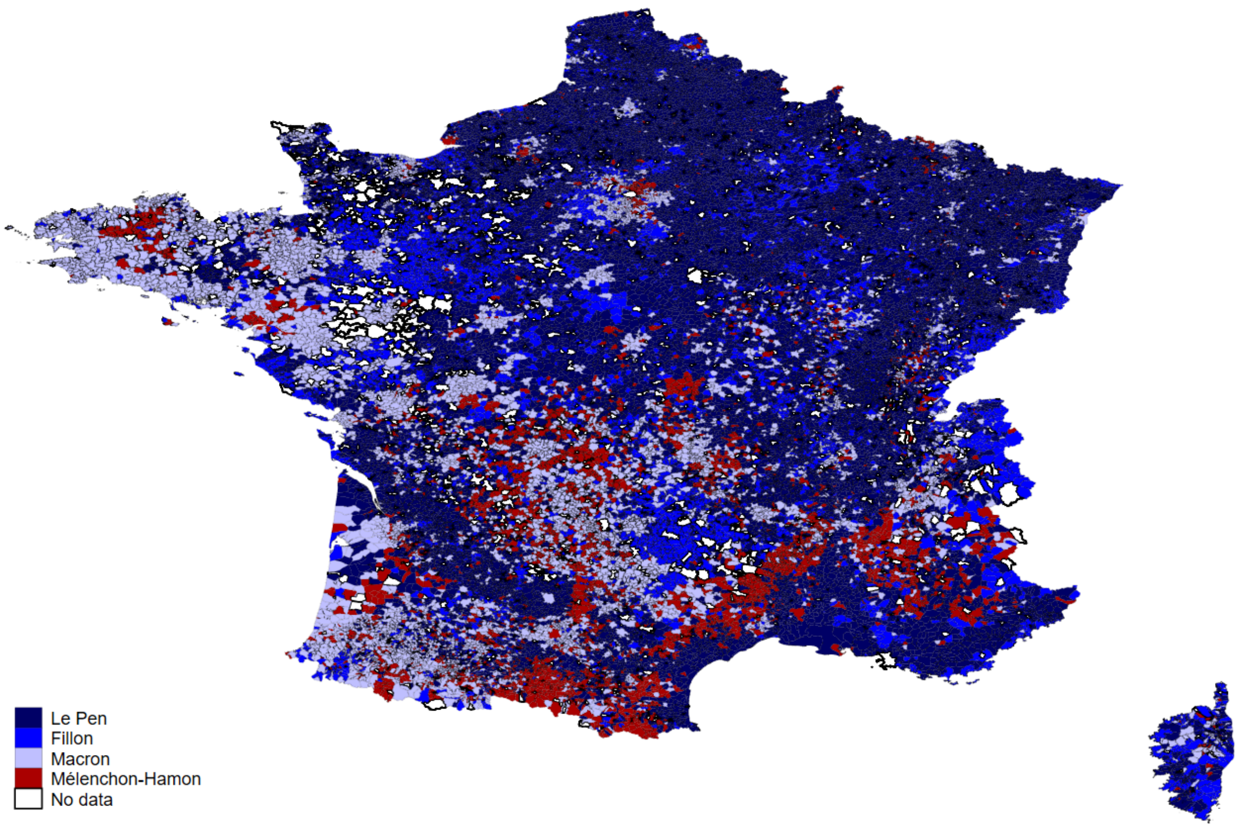


Table 2: Descriptive Statistics: Main variables

	mean	sd	min	max	p25	p50	p75
ΔTurnout	-15.24	11.08	-61.20	42.85	-22.34	-15.73	-8.08
Distance to core cluster (km)	196.66	137.84	0	586.18	97.65	155.38	262.8831
Proximity	-5.01	0.82	-6.38	0	-5.58	-5.05	-4.59
Share 60+	0.29	0.087	0	0.89	0.23	0.27	0.33
Log(Population)	6.21	1.37	0	13.07	5.27	6.09	7.01
Share Farmers	0.03	0 .05	0	1	0	0.01	0.04
Share Artisans	0.04	0.04	0	1	0.02	0.04	0.06
Share Senior Executives	0.06	0.05	0	1	0.02	0.05	0.08
Share Intermediate Occupations	0.13	0.07	0	0.67	0.09	0.134	0.17
Share Employees	0.15	0.06	0	1	0.12	0.16	0.19
Share Other Occupations	0.58	0.11	0	1	0.51	0.58	0.65
ΔTurnout Parliamentary	-8.68	5.96	-69.85	33.33	-12.17	-8.91	-5.46

Notes: ΔTurnout is our dependent variable. Distance to core cluster is the distance to the nearest core cluster in kilometre. Proximity is defined as $-log(1 + Distance)$. ΔTurnout Parliamentary is the change in turnout between the first rounds of the 2017 and 2012 parliamentary elections.

4 Covid and Turnout

This section studies how the rise of the epidemics affected the trade-off between costs and benefits of going to the polling station.

4.1 Empirical strategy

To assess more systematically whether the epidemic had an impact on local turnout, we estimate the following specification:

$$\begin{aligned} \Delta Turnout_c = \beta_1 Clusters_c + \beta_2 Share60{+}_c + \beta_3 Clusters_c \times Share60{+}_c \\ + \beta_4 PoliticalPref_c + \beta_5 Clusters_c \times PoliticalPref_c + Z_c + \delta_g + \varepsilon_c. \end{aligned} \quad (1)$$

The dependent variable $\Delta Turnout_c$ is the difference in turnout at the local elections between 2014 and 2020 in a city c. Explanatory variables aim at capturing the elements in voters' trade-off that were likely to be affected by the pandemic: elements related to local exposure at the time ($\pi\chi$) and elements capturing heterogeneity in individual risk perception (α). More specifically, $Clusters_c$ is a dummy variable that takes value one for all cities considered to be clusters and zero otherwise. In cities considered as clusters, the local probability of catching the virus based on information available at the time (π) was higher than in the rest of the French territory. We also add $Share60{+}_c$, the demeaned share of the city population that is 60 or older, to capture higher risks of severe consequences (higher χ). In line with section 2.2, we also include an interaction term between the variable $Clusters_c$ and $Share60{+}_c$ to capture the higher costs of voting for more exposed individuals in more exposed places. This interaction identifies the total effect of greater local exposure to Covid-19. $PoliticalPref_c$ captures heterogeneity in political preferences at the local level and the interaction with $Clusters_c$ its potential effect on risk perception.

Z_c is a vector of additional variables, unrelated to Covid-19, that may affect the change in local turnout. Specifically, we include the logarithm of the population and the share of population by occupation in city c. We also add the difference in turnout between the 2012 and 2017 parliamentary elections at the city-level. The former controls for specific demographic determinants of changes in turnout while the latter captures the local trend in turnout. δ_g are regional fixed effects - France has 13 regions, depicted in Figure 3 - and ε_c is the error term. Region fixed effects control for administrative differences between regions, among others holidays, which take place in early March in only a subset of regions on a rotating basis. We cluster standard errors at the canton level to correct for potential spatial autocorrelation.[12]

4.2 Local exposure to covid-19 and turnout

We first test that our variable *Clusters* is an accurate proxy for local exposure to covid-19 by estimating the equation (1) without allowing for heterogeneity in political preferences. Similarly to others papers in the literature, one expects turnout to be relatively lower in more exposed places.

Results are presented in Table 3. Column (1) does not include any control. In column (2), we add demographic controls.[13] In column (3) we further include trend in parliamentary election turnout. Our preferred specification is in column (4) where we also include region fixed effects. In clusters, the decrease in turnout is much more pronounced than in other towns in France. The share of people aged 60 and above is on average positively related to the change in turnout, which likely reflects a stronger attachment to elections in this group. Outside of clusters, towns with a one standard deviation higher share of people aged 60 or more saw on average an 0.7 percentage point smaller drop in participation. Among clusters, however, this drop was 6 percentage point larger. Being in a cluster thus significantly reduced turnout, and significantly more so for towns with a high share of people aged 60 years or older. This suggests that the increase in $\pi\chi$ was big enough in some areas to affect the trade-off faced by voters and induce voters to turnout relatively less. These results are in line with the findings of Noury et al. (2021).

Table 4 displays the results of the estimation of our preferred specification using our two alternative definitions of clusters $Prox25$ and $Prox50$. All columns include demographic and parliamentary turnout trend controls as well as region fixed effects. Column (1) is uses our baseline measure, which corresponds to the last column of Table 3. We substitute our preferred cluster definition with *Prox25* in column (2) and with *Prox50* in column (3). Column (4) uses bins based on proximity to core clusters to proxy for close interactions similarly to the different circles in Figure 3. The first bin, *Prox25*, equals 1 for towns in a 25-kilometre range from a core cluster (area in the first circle). The second bin, *Prox2550*, equals 1 for towns between 25 and 50 kilometres of a core cluster (area between first and second circle). And, the last bin, *Prox50100*, equals 1 for towns between 50 and 100 kilometres from a core clusters (area between

[12] A canton is generally a group of towns in rural areas, while it may be a single neighbourhood in a town in dense urban areas. Whenever the canton is defined by a single neighbourhood, we consider the city to which it belongs to be the canton. For Paris, Lyon, and Marseille for which we have district-level electoral outcomes, we define the canton to be an electoral district.

[13] We lose 7 observations from towns for which we have missing demographic characteristics.

Table 3: Turnout estimates: Clusters specification

	(1) ΔTurnout	(2) ΔTurnout	(3) ΔTurnout	(4) ΔTurnout
Clusters	-9.744***	-4.334***	-4.363***	-3.795***
	(1.312)	(1.489)	(1.481)	(1.376)
Share 60+	22.79***	10.74***	9.126***	8.244***
	(0.960)	(0.943)	(0.937)	(0.956)
Clusters x Share 60+	-71.79***	-81.43***	-80.58***	-70.45***
	(18.07)	(20.27)	(20.10)	(19.45)
ΔTurnout Parliamentary			0.171***	0.183***
			(0.0103)	(0.0103)
Observations	33,682	33,675	33,675	33,675
R^2	0.034	0.141	0.149	0.160
Region fixed effects	NO	NO	NO	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for towns considered to be clusters. $Share60+$ is the share of people of 60 or older. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. Columns (2)-(4) include demographic controls, and column (4) also include regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

second and third circle). The reference are towns which are located at a minimum of 100 kilometres from a core cluster. Column (5) introduces proximity to a core cluster in a linear way. *Proximity* is defined as minus the demeaned logarithm of the distance in kilometres between the town and the nearest core cluster plus one. Our results are qualitatively robust to the use of alternative clusters and, unsurprisingly, become less strong the broader the definition of clusters. Column (4) shows that the effect decreases gradually from one concentric circle to the next both on the main effect and on the interaction term. Column (5) confirms the relationship between proximity and turnout. We are confident that our measures do capture heterogeneity in local exposure to Covid-19 as these results show that there is a strong link between local exposure to Covid-19 and turnout, consistently with the results of Noury et al. (2021). This specification however ignores potential differences in individual risk perception.

Table 4: Turnout estimates: Alternative proximity measures

	(1) ΔTurnout *Clusters*	(2) ΔTurnout *Prox25*	(3) ΔTurnout *Prox50*	(4) ΔTurnout *Prox bins*	(5) ΔTurnout *Prox Linear*
Clusters	-3.795***	-1.228**	-1.027**		
	(1.376)	(0.578)	(0.400)		
Share 60+	8.244***	8.454***	8.926***	9.570***	7.116***
	(0.956)	(0.967)	(0.972)	(0.971)	(1.013)
Clusters x Share 60+	-70.45***	-13.82***	-12.94***		
	(19.45)	(5.342)	(3.411)		
Proximity ($< 25km$)				-1.494**	
				(0.593)	
Proximity ($>= 25km$ and < 50)				-1.056**	
				(0.448)	
Proximity ($>= 50km$ and < 100)				-0.405*	
				(0.240)	
Prox25 x Share 60+				-16.17***	
				(5.177)	
Prox2550 x Share 60+				-13.75***	
				(3.998)	
Prox50100 x Share 60+				-5.193*	
				(2.868)	
Proximity					-0.688***
					(0.177)
Prox x Share 60+					-4.392***
					(1.075)
ΔTurnout Parliamentary	0.183***	0.183***	0.183***	0.182***	0.180***
	(0.0103)	(0.0103)	(0.0103)	(0.0104)	(0.0103)
Observations	33,675	33,675	33,675	33,675	33,675
R^2	0.160	0.160	0.161	0.161	0.161
Region fixed effects	YES	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for towns considered to be clusters. In column (1), we use our baseline measure *Clusters*, while we use alternative definitions in columns (2)-(5). All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

4.3 Role for Heterogeneity in Political Preferences?

As mentioned in section 2.2, individual perception and specifically political preferences may influence individuals' decisions to participate to the election during the covid pandemic. While political affinity does not affect the risk factors themselves (after controlling for the share of different occupations or the size of the town among others), it may correlate with the risk perception of voters (α) or with other common determinants of the decision to vote. Before delving into potential mechanisms, this section documents the heterogeneous turnout response of towns along different dimensions of the political spectrum. Our empirical specification rests on equation (1), which includes political preferences variables and their interactions with $Clusters$.

Following the literature, we first check whether towns on the right of the political spectrum reacted differently to the epidemic risk than other towns. To do so, we construct a dummy variable *Top Right* which equals 1 for town where Francois Fillon (Les Républicains) and Marine Le Pen (Rassemblement National) collected the absolute majority of cast votes in the first round of the 2017 Presidential elections and zero otherwise. Table 5 presents the results of the estimation equation (1) in which political preferences,$PoliticalPref_c$, are proxied by the dummy *Top Right*. All columns include demographic controls and trends in turnout, as well as region fixed effects. In column (1), we first include the dummy *Top Right* without its interaction with $Clusters$. The coefficients of interest do not significantly change compared to column (4) in Table 3. In column (2), we add an interaction term between $Clusters$ and *Top Right*. The coefficient on $Clusters$ is no longer significant, while the coefficient on the new interaction term is negative, significant and nearly twice as big as the $Clusters$ coefficient in column (1). All other coefficients are unaffected. This also holds when using alternative measures of clusters in columns (3) and (4). The effect of $Clusters$ in towns with a share of people aged 60 or older seems to be mainly driven by individuals on the right of the political spectrum.

We then restrict the right to the far-right of the political spectrum. We define a dummy variable, *Le Pen*, as equal to 1 in towns where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections and zero otherwise. We exclude from the analysis the towns for which there was more than one leading candidate in these elections. Table 6 displays the results substituting the *Le Pen* dummy for the *Top Right* dummy. The columns are equivalent to the columns of Table 5. The results are very similar to Table 5, suggesting that the effect of $Clusters$ in towns with a share of old people equal to the average seems to be mainly driven by towns on the far-right of the political spectrum. The coefficient on the new interaction term appears even

Table 5: Turnout estimates with Top Right dummy

	(1) ΔTurnout *Clusters*	(2) ΔTurnout *Clusters*	(3) ΔTurnout *Prox25*	(4) ΔTurnout *Prox50*
Clusters	-3.785***	-1.227	-0.348	-0.0650
	(1.375)	(1.188)	(0.594)	(0.407)
Share 60+	8.188***	8.182***	8.407***	8.904***
	(0.955)	(0.954)	(0.966)	(0.971)
Clusters x Share 60+	-70.15***	-59.96***	-12.32**	-12.80***
	(19.41)	(17.93)	(5.206)	(3.401)
Top Right	-0.140	-0.112	-0.0706	0.0699
	(0.142)	(0.142)	(0.144)	(0.147)
Clusters x Top Right		-6.050**	-1.825***	-2.081***
		(2.362)	(0.695)	(0.467)
ΔTurnout Parliamentary	0.182***	0.183***	0.183***	0.182***
	(0.0103)	(0.0103)	(0.0103)	(0.0103)
Observations	33,675	33,675	33,675	33,675
R^2	0.160	0.161	0.160	0.161
Region fixed effects	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)-(2), we use our baseline measure *Clusters*, while we use alternative definitions in columns (3)-(4). *Share*60+ is the share of people of 60 or older. *TopRight* is a dummy variable equal to 1 for town where right-wing candidates collected the absolute majority of cast votes in the first round of the 2017 Presidential elections. Δ*Turnout* is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

higher than in the previous table.

We show in the appendix tables A2 and A3 that these results also hold using alternative measures of preferences for the far-right (e.g. above median vote for Marine Le Pen).

These results for the far right may however be driven by a broad rejection of the system rather and be shared both the far right and far left. To investigate this possibility, we create a dummy variable *Top Extreme* which equals 1 for town where Jean-Luc Mélenchon (La France Insoumise) and Marine Le Pen (Rassemblement National) collected the absolute majority of cast votes in the first round of the 2017 Presidential elections and zero otherwise. As shown in Table 7, neither the coefficient on *Top Extreme* nor the interaction between *Clusters* and *Top Extreme* are significant. As a final check, we add dummies for all major parties in Table 8. The dummies are constructed based on the party of the candidate who collected the greatest share of cast votes during the first round of the 2017 Presidential elections. The far-right is the only party for which the interaction with *Clusters* is stable and statistically significant across all specifications. These tables confirm that the most relevant political dimension to explain the heterogeneous turnout response to the covid crisis is the role of far-right voters.

Table 6: Turnout estimates with *Le Pen* measure

	(1)	(2)	(3)	(4)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
	Clusters	*Clusters*	*Prox25*	*Prox50*
Clusters	-4.289***	-0.539	-0.0421	0.615
	(1.622)	(1.357)	(0.670)	(0.521)
Share 60+	6.766***	6.770***	7.073***	7.721***
	(0.976)	(0.975)	(0.989)	(0.993)
Clusters x Share 60+	-79.20***	-83.80***	-17.42***	-16.84***
	(18.08)	(16.35)	(5.528)	(3.330)
Le Pen	-1.188***	-1.162***	-1.112***	-0.948***
	(0.140)	(0.140)	(0.139)	(0.140)
Clusters x Le Pen		-6.795***	-2.581***	-2.876***
		(2.232)	(0.675)	(0.543)
ΔTurnout Parliamentary	0.175***	0.175***	0.174***	0.173***
	(0.0105)	(0.0105)	(0.0105)	(0.0105)
Observations	32,841	32,841	32,841	32,841
R^2	0.160	0.160	0.160	0.161
Region fixed effects	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)-(2), we use our baseline measure *Clusters*, while we use alternative definitions in columns (3)-(4). $Share60+$ is the share of people of 60 or older. $LePen$ is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Turnout estimates with *Top Extreme* measure

	(1)	(2)	(3)	(4)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
	Clusters	*Clusters*	*Prox25*	*Prox50*
Clusters	-3.789***	-3.941***	-1.343**	-0.982**
	(1.377)	(1.450)	(0.579)	(0.443)
Share 60+	8.367***	8.366***	8.550***	9.060***
	(0.979)	(0.979)	(0.991)	(1.000)
Clusters x Share 60+	-70.36***	-67.77***	-12.67**	-13.13***
	(19.41)	(21.69)	(5.620)	(3.413)
Top Extreme	0.122	0.118	0.0951	0.139
	(0.158)	(0.158)	(0.159)	(0.163)
Clusters x Top Extreme		1.147	0.758	-0.186
		(2.660)	(0.948)	(0.525)
ΔTurnout Parliamentary	0.184***	0.184***	0.184***	0.184***
	(0.0103)	(0.0103)	(0.0103)	(0.0103)
Observations	33,675	33,675	33,675	33,675
R^2	0.160	0.160	0.160	0.161
Region fixed effects	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)-(2), we use our baseline measure *Clusters*, while we use alternative definitions in columns (3)-(4). *Share*60+ is the share of people of 60 or older. *TopExtreme* is a dummy variable equal to 1 for town where extreme candidates collected the absolute majority of cast votes in the first round of the 2017 Presidential elections. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Turnout estimates with political parties interactions

	(1)	(2)	(3)	(4)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
	Clusters	*Clusters*	*Prox25*	*Prox50*
Clusters	-4.364***	1.429	0.460	1.696***
	(1.628)	(1.739)	(0.905)	(0.567)
Share 60+	6.896***	6.897***	7.202***	7.786***
	(0.980)	(0.979)	(0.992)	(0.996)
Clusters x Share 60+	-78.70***	-80.35***	-10.54**	-13.51***
	(18.11)	(19.82)	(5.227)	(3.372)
Melenchon/Hamon	1.388***	1.401***	1.270***	1.254***
	(0.233)	(0.234)	(0.235)	(0.240)
Fillon	0.471**	0.476**	0.536**	0.755***
	(0.223)	(0.224)	(0.223)	(0.226)
Le Pen	-0.706***	-0.678***	-0.620***	-0.380**
	(0.176)	(0.176)	(0.177)	(0.180)
Clusters x Melenchon/Hamon		-3.871	7.023***	3.578***
		(2.510)	(1.191)	(0.896)
Clusters x Fillon		-3.601	-1.833	-3.054***
		(3.198)	(1.282)	(0.863)
Clusters x Le Pen		-8.729***	-2.598***	-3.772***
		(2.441)	(0.916)	(0.595)
ΔTurnout Parliamentary	0.177***	0.177***	0.177***	0.176***
	(0.0105)	(0.0105)	(0.0105)	(0.0105)
Observations	32841	32841	32841	32841
R^2	0.161	0.161	0.162	0.163
Region fixed effects	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)-(2), we use our baseline measure *Clusters*, while we use alternative definitions in columns (3)-(4). $Share60+$ is the share of people of 60 or older. *Melenchon/Hamon*, *Fillon*, *LePen* are dummy variables equal to 1 for town where the respective candidates where the leading candidates in the first round of the 2017 Presidential elections. The reference is towns where the leading candidates in the first round was Emmanuel Macron. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

To make sure that our results are stable we perform a series of robustness checks. First we test that our results holds on alternative samples. Table 9 presents the first set of results. Column (1) shows the results of the estimation of equation (1) on our baseline sample of 32,841 towns. In column (2), we weight the estimation by the population of the town. In column (3), we restrict to town which have a population of at least 1,000 inhabitants. In the remaining columns, the sample is restricted to towns in exposed areas: in column (4) in a 100-kilometre range from a cluster, in column (5) to towns in regions with at least a cluster and in column (6) to towns in departments with at least a cluster. All specifications point to a large decrease in turnout in far-right towns located close to core clusters.[14] It is interesting to note that the effect of the far-right supports in clusters seems particularly strong for small towns. To ensure that our results are not driven by a specific set of clusters, we run our baseline specification on samples from which we remove clusters linked to one core clusters. The results are displayed in Table 10. Column (1) is using our baseline sample, in column (2) we remove the 17 clusters in the area of Ajaccio, in column (3) we remove the clusters on the area of Auray, in column (4) we remove the clusters in the area of Carnac and so on. Coefficients in Table 10 suggests that no specific set of clusters is driving the results, reassuringly the magnitudes of the coefficients of interest is rather stable from one sample to the next.

We then allow for greater spatial autocorrelation in standard errors in Table 11. In the first three columns, the standard errors are clustered at the level of a department, which are significantly bigger than canton used in our baseline. In the remaining three columns, we compute Conley standard errors which allow for spatial autocorrelation between observations in a 100-kilometer range. The results remains virtually unchanged. *Clusters* is not significant, while all other variables of interest are statistically significant.

Finally, we replicate our analysis at different levels of spatial aggregation, such as canton, employment zones, and departments in Table A1 in the appendix. Our main results also hold at these more aggregated levels.

[14] This also holds when introducing a dummy variable for dense urban areas and interactions as shown in Table A4 in the appendix.

Table 9: Turnout estimates with *Le Pen* dummy - Alternative samples

	(1)	(2)	(3)	(4)	(5)	(6)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
	Baseline	*Weighted*	$Pop \geq 1{,}000$	$Dist > 100km$	*Region*	*Department*
Clusters	-0.539	-1.765*	-1.356	-1.364	-0.208	-0.0212
	(1.357)	(0.993)	(1.460)	(1.409)	(1.375)	(1.479)
Share 60+	6.770***	-12.63***	-3.666	1.528	3.937**	2.298
	(0.975)	(1.891)	(2.482)	(2.470)	(1.584)	(3.545)
Clusters x Share 60+	-83.80***	-37.27***	-59.18***	-74.21***	-81.92***	-70.34***
	(16.35)	(9.901)	(15.21)	(16.22)	(16.36)	(15.50)
Le Pen	-1.162***	-0.973***	-0.556*	-1.826***	-1.360***	-1.433**
	(0.140)	(0.224)	(0.288)	(0.326)	(0.235)	(0.563)
Clusters x Le Pen	-6.795***	-3.265**	-4.634**	-5.706**	-6.836***	-5.611**
	(2.232)	(1.504)	(1.953)	(2.326)	(2.257)	(2.265)
Δ Turnout Parliamentary	0.175***	0.281***	0.243***	0.170***	0.166***	0.142***
	(0.0105)	(0.0261)	(0.0377)	(0.0231)	(0.0156)	(0.0343)
Observations	32,841	32,841	8,873	8,600	14,749	3,701
R^2	0.160	0.094	0.029	0.093	0.144	0.115
Region fixed effects	YES	YES	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the 142 towns considered to be clusters on our baseline measure. $Share60+$ is the share of people of 60 or older. $LePen$ is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. Column (1) is estimated on the baseline sample, column (2) shows the population-weighted estimates, column (3) restricts the sample to towns with at least 1,000 inhabitants, in column (4) to towns in a 100-km range of a core cluster, in column (5) to towns in regions with at least a cluster, and in column (6) to towns in departments with at least a cluster. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Turnout estimates with *Le Pen* measure: Sensitivity Analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
Clusters	-0.539	0.311	-0.441	-1.140	-0.686	-0.180	-0.762	-0.470	-0.674	-0.847	-0.281	-0.553
	(1.357)	(1.329)	(1.548)	(1.387)	(1.454)	(1.387)	(1.376)	(1.363)	(1.362)	(1.438)	(1.668)	(1.356)
Share 60+	6.770***	6.628***	6.772***	6.769***	6.768***	6.762***	6.771***	6.766***	6.754***	6.761***	6.753***	6.769***
	(0.975)	(0.974)	(0.975)	(0.975)	(0.975)	(0.975)	(0.975)	(0.975)	(0.975)	(0.975)	(0.974)	(0.975)
Clusters x Share 60+	-83.80***	-73.69***	-94.65***	-88.54***	-84.87***	-72.97***	-86.13***	-80.37***	-78.87***	-81.16***	-96.07***	-84.25***
	(16.35)	(16.76)	(15.28)	(18.32)	(16.28)	(17.06)	(16.33)	(17.04)	(15.99)	(19.27)	(20.74)	(16.44)
ΔTurnout Parliamentary	0.175***	0.175***	0.174***	0.175***	0.175***	0.175***	0.174***	0.175***	0.174***	0.174***	0.174***	0.174***
	(0.0105)	(0.0104)	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0105)
Le Pen	-1.162***	-1.153***	-1.160***	-1.162***	-1.162***	-1.159***	-1.162***	-1.162***	-1.163***	-1.164***	-1.163***	-1.161***
	(0.140)	(0.140)	(0.140)	(0.140)	(0.140)	(0.140)	(0.140)	(0.140)	(0.140)	(0.140)	(0.139)	(0.140)
Clusters x Le Pen	-6.795***	-4.715***	-7.345***	-6.395***	-6.694***	-7.950***	-6.400***	-6.875***	-6.791***	-6.374***	-9.128**	-7.002***
	(2.232)	(1.625)	(2.327)	(2.212)	(2.270)	(2.488)	(2.245)	(2.269)	(2.271)	(2.361)	(3.915)	(2.264)
Observations	32,841	32,824	32,828	32,837	32,839	32,823	32,839	32,838	32,837	32,833	32,774	32,839
R^2	0.160	0.159	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.159	0.160
Region fixed effects	YES	YES	YES	YES	YES	YES	YES	YES				
Core Clusters Removed	NONE	AJACCIO	AURAY	CARNAC	CRACH	CREIL	CREPY	LAGNY	LAMORLAYE	MERY	MULHOUSE	VAUMOISE

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters according to our baseline definition. *Share*60+ is the share of people of 60 or older. *LePen* is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections. Δ*Turnout* is the difference in turnout between 2017 and 2012 parliamentary elections. Column (1) is using our baseline sample, in columns (2)-(12) we remove clusters in the area of a given core cluster. The clusters removed in each columns is indicated in the bottom line of the table. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Turnout estimates with *Le Pen* dummy - Alternative standard errors treatment

	(1)	(2)	(3)	(4)	(5)	(6)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
	Clusters	*Prox25*	*Prox50*	*Clusters*	*Prox25*	*Prox50*
Clusters	-0.539	-0.0421	0.615	-0.539	-0.0421	0.615
	(1.037)	(0.986)	(0.930)	(1.059)	(1.180)	(1.178)
Share 60+	6.770***	7.073***	7.721***	6.770***	7.073***	7.721***
	(1.246)	(1.245)	(1.224)	(1.174)	(1.173)	(1.133)
Clusters x Share 60+	-83.80***	-17.42***	-16.84***	-83.80***	-17.42***	-16.84**
	(20.42)	(5.983)	(5.222)	(22.02)	(6.543)	(6.837)
Le Pen	-1.162***	-1.112***	-0.948***	-1.162***	-1.112***	-0.948***
	(0.166)	(0.158)	(0.156)	(0.191)	(0.161)	(0.145)
Clusters x Le Pen	-6.795***	-2.581**	-2.876***	-6.795***	-2.581***	-2.876***
	(2.213)	(1.133)	(0.735)	(2.134)	(0.723)	(0.545)
ΔTurnout Parliamentary	0.175***	0.174***	0.173***	0.175***	0.174***	0.173***
	(0.0107)	(0.0107)	(0.0106)	(0.00905)	(0.00916)	(0.00894)
Observations	32,841	32,841	32,841	32,841	32,841	32,841
R^2	0.160	0.160	0.161	0.140	0.140	0.141
Region fixed effects	YES	YES	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1) and (4), we use our baseline measure *Clusters*, while we use alternative definitions in all other columns. *Share*60+ is the share of people of 60 or older. *LePen* is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections. Δ*Turnout* is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by department in columns (1)-(3), and computed as Conley standard errors in columns (3)-(6). *** p<0.01, ** p<0.05, * p<0.1.

4.4 Placebos

To confirm that the effects we identify above are causal effects of the pandemic on turnout, we check that the changes in turnout do not reflect underlying long-term trends at the local level, due to changes of D and C for instance. We conduct a placebo exercise where we replace the dependent variable by the change in turnout in the first round of local elections between 2008 and 2014. Turnout is defined, similarly to the definition in the previous subsections, as the number of cast, blank and invalid votes on the number of registered voters. Table 12 presents the results of the estimation equation (1). All columns include demographic and parliamentary turnout trend controls as well as region fixed effects. Columns (1) to (3) estimate equation (1) as in 4.2, while columns (4) to (6) allows for heterogeneity in individual perception as in 4.3. Being a cluster in 2020 has no significant effect on the change in turnout in the previous local elections in all columns. The interaction between $Clusters$ and $Share60+$ is not statistically significant in any of the columns, and neither are the *Le Pen* dummy and its interaction with $Clusters$. Unsurprisingly, $Share60+$ and Δ*Turnout Parliamentary* still have a positive and significant effect on the change in turnout. We conclude that exposure to the covid-19 pandemic did have a causal impact on turnout at the local level. Our next section turns to digging deeper into the mechanisms explaining these changes.

Table 12: Placebo: Change in Turnout 2014-2008

	(1)	(2)	(3)	(4)	(5)	(6)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
	Clusters	*Prox25*	*Prox50*	*Clusters*	*Prox25*	*Prox50*
Clusters	0.559	-0.166	-0.0953	0.749	-0.0446	0.0492
	(1.165)	(0.413)	(0.205)	(1.381)	(0.527)	(0.269)
Share 60+	3.814***	3.870***	3.891***	3.901***	3.964***	3.991***
	(0.718)	(0.720)	(0.723)	(0.742)	(0.744)	(0.748)
Clusters x Share 60+	16.87	-1.529	-0.922	20.27	-1.379	-0.977
	(12.64)	(4.622)	(2.284)	(12.96)	(4.665)	(2.331)
Le Pen				0.0857	0.0942	0.109
				(0.0936)	(0.0944)	(0.0955)
Clusters x Le Pen				-0.198	-0.256	-0.265
				(0.989)	(0.583)	(0.343)
ΔTurnout Parliamentary	0.0437***	0.0436***	0.0436***	0.0419***	0.0418***	0.0417***
	(0.00776)	(0.00777)	(0.00776)	(0.00804)	(0.00805)	(0.00805)
Observations	33,624	33,624	33,624	32,790	32,790	32,790
R^2	0.008	0.008	0.008	0.008	0.008	0.008
Region fixed effects	YES	YES	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2014 and 2008 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1) and (4), we use our baseline measure *Clusters*, while we use alternative definitions in other columns. *Share*60+ is the share of people of 60 or older. *LePen* is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidates in the first round of the 2017 Presidential elections. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. Columns (1)-(3) presents the results of the simplified version of equation (1). We allow for heterogeneity in individual risk perception by adding political variables and its interaction in columns (4)-(6). All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

5 Mechanisms

As pointed out in the survey conducted by the CEVIPOF "Le baromètre de la confiance politique", the sentiment of fear did spread rapidly in the French population between February 2020 and early April 2020. This was a result of the increase in exposure to the virus, but also of people's subjective perception of that risk. While perceived risk may explain the changes in turnout outlined in the previous section, other mechanisms may be at stake. Our placebo exercises show that the local exposure to Covid-19 does not correlate with previous trends in the determinants of turnout. As outlined in section 2.2, however, variations in the stakes of the election (which enter B) or in the other benefits of voting (D) may also have been affected by the local exposure to Covid-19 in March 2020. To tease out the role of risk perception, we analyse the change in cinema attendance in the first two weeks of March 2020 compared to the same weeks the year before.

5.1 Fear of going out?

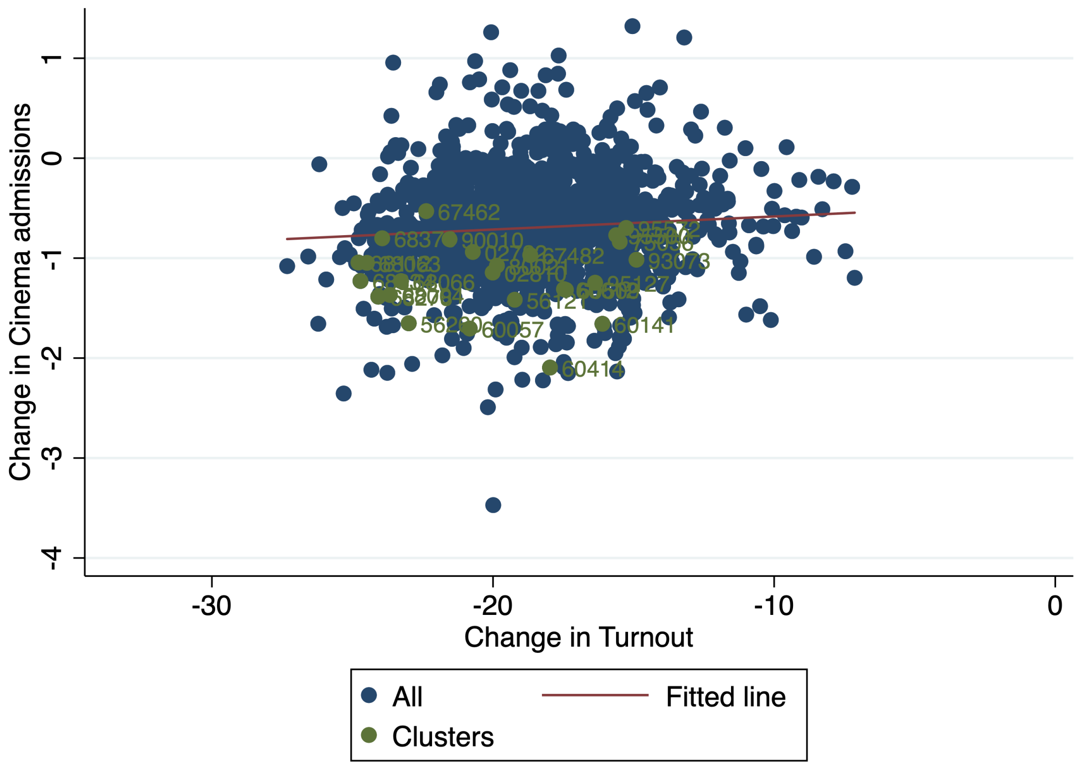
Local changes in cinema attendance on the eve of the Covid-19 epidemic provide a useful proxy for the perception of the risk of going out ($\tilde{\pi}\tilde{\chi}$) and while abstracting from other mechanisms at play in explaining turnout. The cinema audience is large and roughly representative of the French population, with a slight under-representation of people older than 50.[15]. There were 43.26 million viewers in 2019, equivalent to 68.8% of the total population older than 2 year-old in 2019. Cinemas, as many other indoor public places, were considered risky in terms of virus transmission. Similarly to restaurants, bar, theatres or museums, they were subsequently closed for most of 2020.

We use exhaustive data on weekly cinema admissions in France from the French Cinema Centre (Centre National du Cinéma - CNC). Our dataset covers 2,033 cinemas spread across 1,663 towns in France, and contains among others the number of tickets sold per week. We construct the change in cinema admissions at the town level by aggregating the number of tickets sold in the first two weeks of March 2020 and of March 2019 for each French town with a cinema. Our measure of change is the log difference between these two numbers. We focus on the first two weeks of March, as concerns about Covid-19 really started to emerge at that time. In Figure 6, we plot the change in cinema admissions in a town and the average change in turnout at the local elections in towns within 25km. In the Figure, the green dots depict the towns that constitute our clusters. The change in turnout appears positively correlated with

[15] French Cinema Centre (CNC) report "Le public du cinéma en 2019"

the change in cinema admissions, and that seems to be especially true in our clusters.

Figure 6: Changes in Cinema admission in French cities



To test this more formally and understand the role of differences in perception, we estimate a specification similar to our main specification in equation (1) substituting the dependent variable by the change in cinema admissions as defined in Figure 6. Given our focus on cinema admissions, in this section, we restrict our analysis to the potential audience of cinemas. According to a survey from the CNC, geographic proximity is one of the main criteria for choosing a cinema, 88.2% of individual take less than half an hour to travel to their cinema. We then define our demographic variables and political affiliation variables as a population-weighted mean of a given variable across towns in a 25-kilometre range from the town of the cinemas. The geographic variables, however, are defined based on the town to which the cinema belongs to.

5.2 Results

Table 13 shows the results of the cinema specification. All columns include demographic and parliamentary turnout trend controls as well as region fixed effects[16] for comparability with our analysis on turnout. Columns (1) to (3) presents the results using our simplified specification while columns (4) to (6) presents the results of the full specification including the *Le Pen* dummy.[17] For the sake of comparison with previous tables, we included the estimation with our preferred measure of Clusters in column (1) and (3). However, we do not think the results from column (3) are exploitable given how little variation we have - especially for the $Clusters$ x *Le Pen* interaction. In the other columns, which uses $Prox25$ or $Prox50$ instead, have more variation as the number of clusters is much higher in these definitions. Consistently with Figure 6, we find that that the coefficient on $Clusters$ is negative and significant in columns (1) to (3). Cinemas located in towns connected to the centres of the outbreak saw a stronger drop in admissions, suggesting that the fear of catching the virus was higher in those towns. The coefficient on the interaction between $Clusters$ and $Share60+$ is negative but only significant in column (2). This may reflect a difference in the age structure of people who go to the cinema and people who vote. Unfortunately, we do not have data on audience characteristics to check whether that is a valid claim. The results in columns (4) to (6) are broadly in line with what we find on turnout. The effect of $Cluster$ on its own is much lower and is no longer significant in column (5), while the interaction between $Clusters$ and *Le Pen* is negative and significant in both columns. As in the previous table, the interaction between $Clusters$ and $Share60+$ is of the expected sign but not significant. These results confirm that cinema admissions went down more in towns located close to the identified of the Covid-19 outbreak, and particularly so if they were in an area that voted predominantly for the far right in the 2017 presidential election. We take these results as suggesting evidence that the perception of the risk associated to the virus is not the same across the political spectrum. Areas with a high support for the far right seem to have shied away from cinemas, and from voting, relatively more than others in the vicinity of infection clusters. This does not prove that the heterogeneity in turnout responses of far-right towns was solely due to different risk perceptions, but it does suggest that it contributed to it.

[16]Region fixed effects control among others for holidays, which take place in early March in only a subset of regions on a rotating basis. Holidays are synchronized within a region.

[17]To compute this dummy, we first calculate the population-weighted share of vote collected by the main candidates in the 25-km area surrounding the location of the cinema, and then compare these shares. The dummy equals one whenever Marine Le Pen received the highest share.

Table 13: Cinema estimates with Le Pen interactions

	(1)	(2)	(3)	(4)	(5)	(6)
	ΔTickets	ΔTickets	ΔTickets	ΔTickets	ΔTickets	ΔTickets
	Clusters	*Prox25*	*Prox50*	*Clusters*	*Prox25*	*Prox50*
Clusters	-0.406***	-0.604***	-0.253***	-0.336**	-0.159	-0.175**
	(0.0935)	(0.126)	(0.0539)	(0.150)	(0.205)	(0.0720)
Share 60+	-0.239	-0.288	-0.374	-0.114	0.134	-0.0692
	(0.821)	(0.820)	(0.829)	(0.832)	(0.819)	(0.835)
Clusters x Share 60+	-1.144	-7.136***	-0.799	-0.765	-2.155	-0.540
	(1.934)	(1.927)	(1.054)	(2.282)	(2.729)	(1.118)
Le Pen				0.0284	0.0406	0.0384
				(0.0382)	(0.0381)	(0.0385)
Clusters x Le Pen				-0.0955	-0.569***	-0.187*
				(0.141)	(0.163)	(0.0995)
Turnout Parliamentary	0.0117	0.0118	0.0110	0.0131	0.0112	0.0110
	(0.0104)	(0.0104)	(0.0103)	(0.0107)	(0.0105)	(0.0106)
Observations	1,390	1,390	1,390	1,390	1390	1390
R^2	0.071	0.071	0.076	0.072	0.079	0.078
Region fixed effects	YES	YES	YES	YES	YES	YES

Notes: The dependent variable is the difference log difference between the number of tickets sold in the first two weeks of March 2020 and the first two weeks of March 2019. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)/(4), we use our baseline measure *Clusters*, while we use alternative definitions in all other columns. *Share*60+ is the share of people of 60 or older. *LePen* is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

6 Conclusion

This paper shows how Covid-related risk affected participation across the French territory in the March 2020 local elections. We document that participation went down more in towns exposed to higher Covid-19 risk, an effect that is largely driven by towns on the far right of the political spectrum, as measured by their vote in the 2017 presidential election. This result holds conditional on observable measures of the risk and on a number of socio-demographic factors at the town level. It is robust across specifications and sub-samples, and cannot be explained by specific pre-trends in participation in far-right towns. We also show that the division of the political spectrum between far-right and others seems the most relevant in capturing the heterogeneity in the local change in participation.

Digging further into the mechanisms, we consider different rationales for such a pattern. One possibility is that far-right voters in France were more prone to lose faith in the political system due to the covid-crisis, or were less attached to voting and responded more to a given change in risk perception. Another is that they exhibit on average a higher degree of risk aversion, and respond more to the same increase in risk than other towns. To further disentangle the channels, we show that cinema admissions went down more in towns close to identified clusters of infection, particularly so if the surrounding towns were far-right towns. We take this as suggestive evidence that the subjective perception of risk can at least partly explain the differential response of far-right towns in terms of turnout.

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A Appendix

Table A1: Turnout estimates - Aggregated

	(1)	(2)	(3)
	ΔTurnout	ΔTurnout	ΔTurnout
	Canton	*ZE*	*Dep*
Clusters	-0.524	-2.393	-0.876
	(1.017)	(1.511)	(0.998)
Share 60+	-13.95***	-5.818	11.67
	(4.082)	(8.571)	(14.74)
Clusters x Share 60+	-28.44**	-43.29**	-34.54**
	(12.98)	(20.05)	(14.40)
Le Pen	-0.225	-0.312	-0.0776
	(0.254)	(0.442)	(0.635)
Clusters x Le Pen	-3.879***	-1.961	-3.044**
	(1.388)	(1.314)	(1.286)
ΔTurnout Parliamentary	0.402***	0.381***	0.280*
	(0.0603)	(0.0937)	(0.155)
Observations	2,048	304	96
R^2	0.270	0.393	0.660

Notes: Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections calculated at different administrative levels: at the level of the canton in columns (1), at the level of the Employment Zone in columns (2), and at the level of the Departement in columns (3). *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters in our baseline measure. *Share*60+ is the share of people of 60 or older. *LePen* is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls. OLS estimation. Standard errors in parentheses are robust. *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Turnout estimates with *Le Pen* - Alternative measure

	(1)	(2)	(3)	(4)
	ΔTurnout	ΔTurnout	ΔTurnout	ΔTurnout
	Clusters	*Clusters*	*Prox25*	*Prox50*
Clusters	-3.792***	-1.430	-0.0440	0.500
	(1.342)	(1.491)	(0.635)	(0.499)
Share 60+	7.063***	7.065***	7.326***	7.925***
	(0.972)	(0.971)	(0.983)	(0.993)
Clusters x Share 60+	-69.35***	-72.49***	-15.31***	-15.27***
	(19.42)	(18.37)	(5.607)	(3.353)
LEPEN High	-0.945***	-0.925***	-0.871***	-0.718***
	(0.141)	(0.140)	(0.141)	(0.142)
Clusters x LEPEN High		-4.833**	-2.480***	-2.746***
		(2.266)	(0.663)	(0.538)
ΔTurnout Parliamentary	0.175***	0.175***	0.175***	0.174***
	(0.0103)	(0.0103)	(0.0103)	(0.0103)
Observations	33,675	33,675	33,675	33,675
R^2	0.162	0.162	0.162	0.163
Region fixed effects	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)-(2), we use our baseline measure *Clusters*, while we use alternative definitions in columns (3)-(4). *Share*60+ is the share of people of 60 or older. *LEPEN High* is a dummy variable equal to 1 for town where the share of Marine Le Pen votes was higher than the median in the first round of the 2017 Presidential elections. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Turnout estimates with *Le Pen* measure by tercile

	(1) ΔTurnout *Clusters*	(2) ΔTurnout *Clusters*	(3) ΔTurnout *Prox25*	(4) ΔTurnout *Prox50*
Clusters	-3.754***	1.031	1.169*	1.736***
	(1.320)	(1.185)	(0.649)	(0.509)
Share 60+	6.687***	6.677***	6.968***	7.567***
	(0.978)	(0.977)	(0.991)	(0.999)
Clusters x Share 60+	-68.72***	-74.11***	-17.04***	-16.59***
	(19.27)	(17.15)	(5.809)	(3.319)
LEPEN Tercile 2	-1.289***	-1.269***	-1.183***	-0.993***
	(0.151)	(0.151)	(0.152)	(0.152)
LEPEN Tercile 3	-1.406***	-1.375***	-1.284***	-1.059***
	(0.188)	(0.188)	(0.187)	(0.187)
Clusters x LEPEN T2		-5.822***	-3.498***	-3.698***
		(1.881)	(0.877)	(0.606)
Clusters x LEPEN T3		-8.838***	-4.323***	-4.231***
		(2.806)	(0.911)	(0.631)
ΔTurnout Parliamentary	0.171***	0.171***	0.171***	0.169***
	(0.0103)	(0.0103)	(0.0103)	(0.0103)
Observations	33,675	33,675	33,675	33,675
R^2	0.163	0.163	0.163	0.165
Region fixed effects	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)-(2), we use our baseline measure *Clusters*, while we use alternative definitions in columns (3)-(4). *Share*60+ is the share of people of 60 or older. *LEPEN Tercile 2* and *LEPEN Tercile 3* are a dummy variables equal to 1 for town where the share of Marine Le Pen votes are the second and third tercile in the first round of the 2017 Presidential elections, respectively. $\Delta Turnout$ is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Turnout estimates with *Le Pen* measure including Big Urban Area dummy

	(1) ΔTurnout *Clusters*	(2) ΔTurnout *Clusters*	(3) ΔTurnout *Prox25*	(4) ΔTurnout *Prox50*
Clusters	-4.730**	-0.977	-1.146	-0.575
	(2.099)	(1.628)	(0.835)	(0.630)
Share 60+	6.676***	6.689***	6.859***	7.193***
	(0.977)	(0.977)	(0.990)	(0.995)
Big Urban Area	0.130	0.134	0.0111	-0.201
	(0.251)	(0.250)	(0.250)	(0.250)
Clusters x Share 60+	-77.45***	-82.19***	-13.21**	-12.00***
	(18.47)	(16.92)	(5.881)	(3.371)
Clusters x Big Urban Area	1.409	1.225	1.826**	2.547***
	(2.562)	(2.190)	(0.874)	(0.630)
Le Pen	-1.057***	-1.034***	-1.024***	-0.898***
	(0.157)	(0.157)	(0.156)	(0.156)
Big Urban Area x Le Pen	-0.539*	-0.526*	-0.421	-0.332
	(0.302)	(0.302)	(0.306)	(0.304)
Clusters x Le Pen		-6.688***	-2.038***	-2.187***
		(2.182)	(0.682)	(0.577)
ΔTurnout Parliamentary	0.174***	0.174***	0.174***	0.173***
	(0.0104)	(0.0104)	(0.0104)	(0.0105)
Observations	32841	32841	32841	32841
R^2	0.160	0.160	0.160	0.162
Region fixed effects	YES	YES	YES	YES

Notes: The dependent variable is the difference in turnout between 2020 and 2014 local elections at the town level. *Clusters* is a dummy variable equals to 1 for the towns considered to be clusters. In columns (1)-(2), we use our baseline measure *Clusters*, while we use alternative definitions in columns (3)-(4). *Share*60+ is the share of people of 60 or older. *LePen* is a dummy variable equal to 1 for town where Marine Le Pen was the leading candidate in the first round of the 2017 Presidential elections. *Big Urban Area* is a dummy equal to 1 for big urban areas. Δ*Turnout* is the difference in turnout between 2017 and 2012 parliamentary elections. All columns include demographic controls and regional fixed effects. OLS estimation. Standard errors in parentheses are clustered by canton. *** p<0.01, ** p<0.05, * p<0.1.

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