Covid-19 and Preferences for Progressive Taxation: Evidence from a 2020 U.S. Ballot Proposal

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Existing theory suggests that periods of economic hardship can make progressive taxation more popular with voters. I argue that the negative impacts of the Covid-19 pandemic are likely to have bolstered support for this type of taxation among American voters by increasing demands for the wealthy to contribute more. Combining zip code-level health data and results from an Illinois referendum in 2020, I show that moving from the 25th to the 75th percentile in Covid-19 cases was associated with a 1.6 p.p. higher vote share in favour of a ballot proposal to increase the top marginal income tax rate. In line with a hardship mechanism, this relationship is especially apparent in areas that were more vulnerable to the pandemic's economic consequences.

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Introduction

Rising inequality in the United States and other Western countries has fuelled calls in recent years for greater tax progressivity (e.g. Piketty, 2013; Saez and Zucman, 2019). While these proposals would result in welfare gains for many voters, progressive taxation is not always popular among the electorate (Scheve and Stasavage, 2021). Identity politics, ideological attachments, a lack of information and trust in government have all been proposed as explanations for why voters may or may not support increased taxes on the rich (Alesina and Giuliano, 2011; Bartels, 2005; Boudreau and MacKenzie, 2018; Dahlberg, Edmark, and Lundqvist, 2012; Luttmer, 2001; Peyton, 2020).

Another view suggests that experiences with economic hardship can shift preferences for redistribution (e.g. Margalit, 2013). In a simple median voter model, a decline in the income of poorer voters predicts an increase in demand for taxes on the rich as a way to improve their economic well-being (Meltzer and Richard, 1981). Besides these material motivations, changes in economic fortunes can also trigger concerns about fairness among those who are either directly or indirectly exposed to hardship (Alesina and Angeletos, 2005; Alvarado, 2022; Cavaille, 2023; Scheve and Stasavage, 2010, 2016; Stantcheva, 2020). During periods of economic downturn, voters may see it as fair for the rich to contribute more because they have a greater ability to pay or as a way to compensate the poor for disparate negative economic impacts of events that are beyond their control.

Echoing these arguments, popular discourse portrayed the early period of the Covid-19 pandemic as a potential catalyst for progressive tax reform in America (e.g. Schwarzkopff and Alexander, 2020). Negative health impacts and lockdowns caused economic hardship for many voters, especially those that were already economically marginalized (Adams-Prassl, Boneva, Golin, and Rauh, 2020). Meanwhile, the wealthy experienced less difficulties and by some accounts even increased their wealth share during this period (Chancel, Piketty, Saez, and Zucman, 2021). The existing literature suggests that voters who were especially affected by job or wage losses during the pandemic, either through their own experiences or those of their family, friends and neighbours, should become more supportive of progressive taxation. Voters may demand compensation

for those who were disproportionately affected by the pandemic or because they believe it is fair for the wealthy to pay more because they were less burdened by the pandemic.

Building on these arguments, recent survey research has tested whether the pandemic shocked voters' redistributive preferences. Rees-Jones, D'Attoma, Piolatto, and Salvadori (2022) find that individuals living in areas where the impacts of Covid-19 were greatest are more supportive of social safety net expansions. While these authors do not find that those same individuals are more supportive of increasing taxes on the rich, Klemm and Mauro, 2022 (2022) show that serious illness and job loss caused by the pandemic are associated with higher support for progressive tax reforms. Experimental work has also manipulated information about the pandemic with mixed results (e.g. Cappelen, Falch, Sørensen, and Tungodden, 2021; Yildirim, 2020).

This nascent body of research has tended to focus on hypothetical and imprecise tax proposals. In this research note, I ground the existing literature in a real-world case. I study the relationship between local Covid-19 case burdens and support for progressive taxation in an Illinois referendum in November 2020. The ballot initiative asked voters whether they would support a change from an existing "flat tax" scheme to a graduated income tax in which higher incomes would be taxed at higher marginal rates. The proposal was defeated, but its coincidental timing with the pandemic allows me to compare support for the initiative in areas that more or less impacted by Covid-19.

Using zip code-level data, I identify a positive relationship: moving from the 25th to 75th percentile in Covid-19 cases correlates with approximately 1.6 percentage point (p.p.) higher support for the progressive taxation scheme. While these estimates are non-causal, I show that the case count in 2020 is not associated with preferences for tax progressivity in the years preceding the pandemic, which lends support to the idea that exposure to the pandemic may have moved voting behaviour on this issue. Since case counts are only an indirect measure for the pandemic's economic impacts, I show that the estimated relationship is strongest in areas that were a priori more vulnerable to economic dislocation, suggesting a hardship mechanism is plausible.

While experimental research has shown how economic hardship can affect redistributive preferences (e.g. Alesina and Giuliano, 2011; Durante, Putterman, and van der Weele, 2014; Scheve

and Stasavage, 2021), it is rare to be able to test these predictions using a real-world case like the Illinois ballot initiative. My findings also illuminate the relationship between the Covid-19 pandemic and political attitudes (Neundorf and Pardos-Prado, 2022). Recent analyses have focused on the pandemic's effects on support for incumbents (e.g. Baccini, Brodeur, and Weymouth, 2021; Herrera, Ordoñez, Konradt, and Trebesch, 2020; Wu and Huber, 2021) and experimental and survey work has tended to look at policy preferences in the abstract (Blumenau, Hicks, and Pahontu, 2023; Cappelen et al., 2021; Klemm and Mauro, 2022; Rees-Jones et al., 2022). I synthesize these two approaches by looking at observational voting data on a specific tax policy proposal.

The Illinois Referendum on Progressive Taxation

The 1970 Illinois Constitution explicitly prohibits the state from setting graduated tax rates based on income. In 2018, Democratic gubernatorial candidate J.B. Pritzker campaigned and won on a promise to replace this "flat tax" system with a more progressive scheme. Making the necessary constitutional amendment required at least 60% support in a referendum, which was put to voters during the 2020 General Election. Ultimately, only 46.7% of voters supported the reform.

At the time of the referendum, all taxpayers paid a rate of 4.95%. In the months prior, the legislature had passed a pre-emptive law with specific rates that would become effective if the ballot initiative passed: those earning below $250,000 would continuing paying 4.95% or slightly less, while earnings above that figure would be taxed at 7.75% or greater (see Appendix A for full details). Proponents of the plan claimed that if the initiative were to pass, only the top 3% of earners would see an increase in their tax bill, with the rest of population paying the same rate or lower.

The referendum was planned well in advance of the pandemic, but Covid-19 figured into the campaign. Proponents of progressive taxation argued that, given the disparate economic harms caused by the pandemic, increasing tax rates on the wealthy would better account for their ability to pay. Governor Pritzker believed that the measure was "needed perhaps now more than ever ... [in order to] alleviate some of the burden on the working class and middle class" (quoted in Pearson, 2020). One editorial put it this way: "workers who eke by on modest hourly or gig-

economy incomes ... have been disproportionately thrown out of work by this pandemic ... people who are fortunate enough to still have a job and pull in a high income should pay a little more" (Chicago Sun-Times Editorial Board, 2020). Supporters also pointed out that progressive taxation could serve as a kind of compensation for those who had sacrificed more during the pandemic. They argued it was unfair that the "current tax system forces the essential workers who have kept this state and this country going over the last few months ... to pay the same tax rate as millionaires and billionaires" (Fulk, 2020).

Data and Empirical Strategy

To investigate the relationship between the Covid-19 pandemic and support for the progressive tax proposal, I use data from the Illinois Department of Public Health (IDPH) on the total number of Covid-19 cases by zip code. Because the majority of voters cast their ballots early in 2020, I count the total number of cases recorded in each zip code before early voting began and mail-in ballots were sent to voters (see Appendix B). I combine the case count data with precinct-level returns from the 2018 and 2020 elections. Because precinct boundaries do not perfectly align with zip codes, I distribute voting results from each precinct to corresponding zip codes using a geographic weighting scheme (see Appendix C). Finally, I use covariate data at the zip code-level from the 5-year estimates in the 2019 American Community Survey.

I model support for the progressive taxation initiative in zip code z using OLS:

$$\text{YesTax}\%_{zc} = \beta \log(\text{CovidCases}_{zc}) + \mathbf{X}_{zc}\gamma + \lambda_c + \varepsilon_{zc}$$

The coefficient β measures the partial correlation between support for the tax initiative ($\text{YesTax}\%_{zc}$) and the number of pre-election Covid-19 cases (CovidCases_{zc}). The vector $\mathbf{X}_{zc}$ includes a set of control variables (see notes to Table 1 for full list), the most important of which are the past vote share for the incumbent governor, racial minority population shares, measures of socioeconomic well-being, and participation in economic industries affected by the pandemic. These controls account for the fact that areas with more Democratic voters, minorities, and people with lower incomes are likely to both experience more Covid-19 cases and be more supportive of the tax initiative

a priori. A set of county fixed effects, λ_c, addresses location-specific sources of confounding.

Results

Table 1 presents the results. The first model reveals a positive bivariate correlation between a zip code's Covid-19 case count and its support for the referendum proposal. The second model introduces control variables and county fixed effects. In this more restrictive model, a 25% increase in Covid-19 cases is associated with a roughly $\beta \times \log\left(1.25\right) = 0.1$ percentage point (p.p.) higher vote share for the progressive tax initiative.

[Table 1 about here]

The magnitude of this partial correlation may seem small, but it is worth noting that there is significant dispersion in the number of Covid-19 cases across zip codes. For example, moving from the 25th to the 75th percentile in case counts (i.e. 7 to 198 cases) implies over a 2,700% increase. A shift of that size correlates with a 1.6 p.p. increase in support for the graduated tax system. My estimates are also comparable to recent survey research on this topic: Rees-Jones et al. (2022) find that a one standard-deviation (s.d.) increase in county-level Covid-19 exposure is associated with a roughly 1.4 p.p. greater likelihood of supporting an increase in taxes on high incomes (although their estimate is not statistically significant). In my data, a 1 s.d. (460 case) increase in the median zip code's Covid-19 cases (23) correlates with 1.5 p.p. higher support for the progressive tax.

Placebo tests

The analyses in Table 1 attempt to control for a number of observable confounders. Yet it is possible that some omitted variable may be biasing the results. To investigate this possibility, I conduct two placebo tests. First, I investigate voting behaviour in a 2014 non-binding advisory referendum on a "Millionaire's Tax." This proposal sought to increase the tax rate on incomes greater than $1 million by 3%, with the additional revenue being earmarked for education spending. The proposal won 59.9% of voters' support, but the initiative was never implemented. Since this referendum

occurred eight years prior to the pandemic, there should be no relationship between the Covid-19 case burden and support for the Millionaire's Tax, unless there is some unobserved, time-invariant confounder that explains both of these phenomena.

Because precinct boundaries are not available for elections prior to 2016, I link the 2014 referendum results to the 2016 precinct boundaries. While there are typically no radical changes in these boundaries between elections, differences in the exact locations of areas with the same precinct name in 2014 and 2016 are unavoidable. Irreconcilable differences in naming conventions between the two election years also produce missing voting results for approximately 23% of precincts.

With these caveats in mind, Table 2 presents the results of the placebo test. The first two columns repeat the earlier analyses on the partial correlation between the Covid-19 case count and support for the 2020 progressive tax proposal, except with the sample restricted to these areas that are not missing data on vote shares in the 2014 Millionaire's Tax referendum. The coefficients here are nearly identical to those in Table 1 above, suggesting that any different patterns in the 2014 electoral data cannot be explained by changes in the sample due to missing values.

The third and fourth columns focus on support for the 2014 proposal. The coefficients on the Covid-19 case count variable are small and, in the case of the multivariate model, statistically insignificant. In fact, the estimated relationship between cases and support for progressive taxation is around four times larger in the 2020 election than in 2014.

[Table 2 about here]

As a second placebo test, I turn to public opinion surveys conducted by the Paul Simon Public Policy Institute just before the pandemic began in Illinois. For each respondent in two separate survey waves (March 2019 and February 2020), I assign the number of cases that occurred in their area during the lead-up to the 2020 ballot initiative. I also code a binary variable indicating whether they "strongly favour" or "somewhat favour" the progressive tax proposal on the ballot. I then regress this measure of support on the post-survey number of Covid-19 cases and a series of individual-level controls (see notes to Table 2), as well as county and survey-wave fixed effects.

The results from this analysis are presented in the final column of Table 2. The coefficient estimate implies that a 25% rise in cases would produce an 0.02 p.p. increase in support for the tax proposal. Unfortunately, there is no survey data on support for progressive taxation at the zip code-level after the pandemic began, but the estimate from the pre-pandemic public opinion data is several times smaller than the estimates from the 2020 electoral data. Taken together with the tests using the 2014 referendum, these results provide reassurance that unobserved confounding is not driving both support for progressive taxation and Covid-19 exposure in the 2020 analyses.

Covid-19 cases and economic hardship

Existing theory suggests that the pandemic's relationship with tax preferences should be channelled through reductions in voters' economic well-being. To demonstrate the plausibility of this mechanism, I conduct two additional analyses. First, in Appendix E, I show that Covid-19 case counts in the lead-up to the election are in fact associated with job losses. Because the relevant employment data is not available by zip code, I instead analyze year-over-year changes at the county-level. I find that moving from the 25th to 75th percentile in case counts is associated with average job losses of 2.8 p.p. between the pandemic's onset and when voting began. The average employment change for the county at the 25th percentile in Covid-19 cases during this period was -5.1 p.p., so the initial economic consequences of the pandemic were not subtle.

A second implication of the economic hardship mechanism is that the relationship between Covid-19 cases and tax preferences should be strongest in areas that were most harmed economically by the pandemic. Again, a lack of localized and high frequency employment data means that I cannot measure hardship directly at the zip code-level, but numerous studies have identified the characteristics that made communities especially vulnerable to economic dislocation. For one, low-income workers were disproportionately harmed by the disruption to the economy and had fewer savings to mitigate their employment and wage losses (Gould and Kassa, 2021; Long, Dam, Fowers, and Shapiro, 2020). Race and ethnicity were also important factors: an August 2020 poll found that 43% of Black, 53% of Hispanic and 47% of Asian households had someone lose their job or

suffer wage cuts during the first months of the pandemic, compared with 38% of white households (Parker, Minkin, and Bennett, 2020). Racial minorities were also more likely to contract the virus, creating an additional burden on household finances (Adhikari et al., 2020). Finally, job losses were concentrated in sectors heavily impacted by public health restrictions and declines in revenue, including restaurants, hotels and entertainment venues (see Appendix F for data from Illinois).

To capture the multidimensional nature of pandemic-related economic vulnerability, I construct an index variable that estimates each zip code's pre-Covid susceptibility to the pandemic's negative economic consequences (see Appendix G for details on index construction). This composite variable aggregates the following indicators using inverse-covariance weighting: median household income (reversed), the percentage of residents that are white (reversed), and the percentage working in leisure and hospitality sectors. To test whether the relationship between Covid-19 cases and tax preferences is stronger in areas that were more economically vulnerable, I estimate the same models as in Table 1, except with additional interaction terms between the log case count variable and the vulnerability index, grouped into equally-sized bins based on decile.

Figure 1 summarizes the conditional associations between support for the progressive tax initiative and the local case burden across levels of pre-pandemic economic vulnerability. The estimates reveal that the relationship between Covid-19 cases and support for the progressive tax proposal is largely driven by zip codes that were especially vulnerable to the economic consequences of the pandemic. The relationship is only positive and statistically distinguishable from zero in areas of high vulnerability (i.e. more than 0.1 s.d. above the average). For areas in the top 10% of vulnerability, a doubling of cases is associated with 0.5 p.p. greater support for the tax proposal, compared to a change of roughly 0.1 p.p. at the median vulnerability. Consistent with extant theories of economic welfare and preferences for redistribution, these results suggest that Covid-19 cases are only related to voting behaviour on the ballot initiative in areas where the case burden was most likely to have caused economic dislocation.

[Figure 1 about here]

Conclusion

This research note has documented a positive association between local Covid-19 case burdens and support for progressive taxation in an Illinois ballot initiative. The findings are descriptive, but placebo tests offer some indication that the pandemic moved opinion on this policy issue. Consistent with existing theory, the estimated relationship is strongest in areas that were especially prone to the economic consequences of rising case counts.

This study adds real-world behavioural evidence to recent survey and experimental research on the relationship between Covid-19 exposure and support for redistribution (Blumenau et al., 2023; Cappelen et al., 2021; Klemm and Mauro, 2022; Rees-Jones et al., 2022; Rigoli, 2020). An open question is just how persistent the attitudinal effects of the pandemic might be on this issue. Rees-Jones et al. (2022) find that experiences early on in the pandemic continued to influence attitudes toward social safety net spending almost a year later. Yet in Margalit's (2013) study of the Great Recession, the pro-redistributive preferences of the recently unemployed dissipated after they regained employment. The persistence of the patterns I identify may therefore be a question of how persistent the disparities caused by the pandemic become.

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Table 1: Covid-19 and support for progressive taxation in Illinois

	% supporting progressive taxation (measured from 0 to 100)	
Log cases	5.992*	0.480*
	(0.178)	(0.153)
Observations	1,366	1,350
R^2	0.509	0.978
Covariates	No	Yes
County FE	No	Yes

Robust standard errors in parentheses. Second model includes the following covariates: log population, population density, 2018 Democrat gubernatorial vote share, median household income, Gini coefficient, and the share of the population that is: under 18, over 65, Black, Hispanic, living in poverty, holding a bachelor's degree, as well as the percent working in the following industries: education, healthcare and social assistance; leisure and hospitality; government. *p<0.05

Table 2: Placebo tests

	Electoral data: % supporting progressive taxation (measured from 0 to 100)				Survey data: Support tax proposal (measured 0/1)
	2020 tax proposal		2014 tax proposal		Mar. 2019 & Feb. 2020
Log cases in 2020	5.494*	0.493*	1.289*	0.131	0.001
	(0.196)	(0.164)	(0.145)	(0.198)	(0.017)
Observations	1,233	1,221	1,233	1,221	1,068
R^2	0.498	0.974	0.100	0.839	0.312
Covariates	No	Yes	No	Yes	Yes
County FE	No	Yes	No	Yes	Yes
Survey wave FE	–	–	–	–	Yes

Robust standard errors in parentheses. Electoral data models include the following covariates: log population, Democrat gubernatorial vote share (in 2014 and 2018, respectively), median household income, Gini coefficient, and the share of the population that is: under 18, over 65, Black, Hispanic, living in poverty, holding a bachelor's degree, as well as the percent working in the following industries: education, healthcare and social assistance; leisure and hospitality; and government. Survey data model controls for gender, age and its square, education, race, household income and party affiliation.*p<0.05

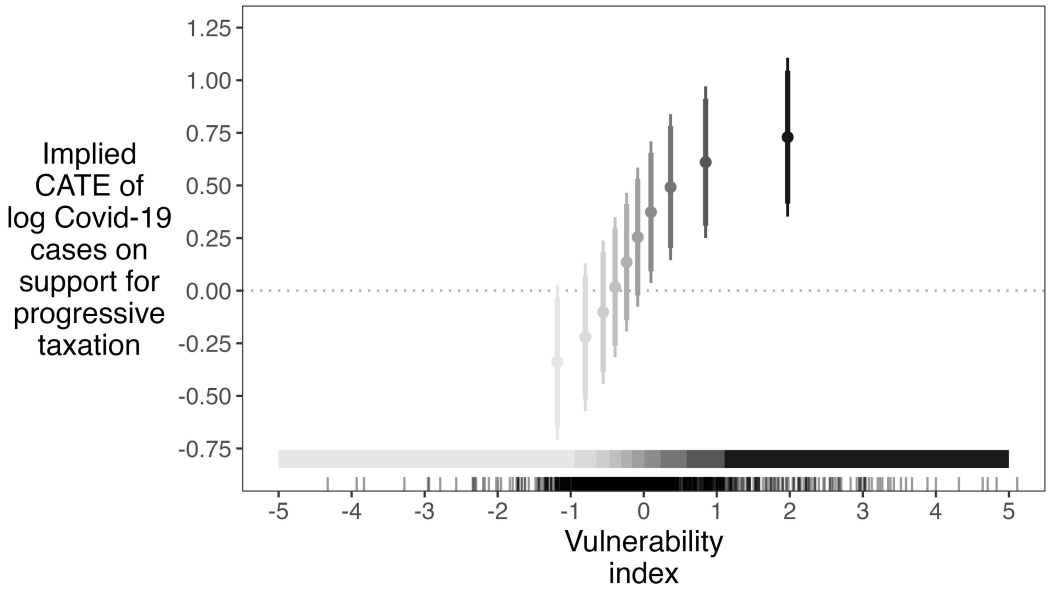

Figure 1: Association between Covid-19 cases and support for the progressive tax proposal by pre-pandemic economic vulnerability decile

Plot summarizes point estimates and 95% confidence intervals from an OLS model interacting the log Covid-19 case count with the pre-treatment vulnerability index, binned into deciles (indicated by shading). The model also adjusts for county fixed effects and the covariates listed in the notes to Table 1. Values on the x-axis are scaled in terms of index standard deviations. ($n = 1,220$).

Appendix

Contents

A Full details of proposed tax rates

At the time of the referendum, all Illinoisans paid an income tax rate of 4.95%. In anticipation of the referendum succeeding, state lawmakers passed a revised schedule in Senate Bill 687 that would implement the proposed progressive tax system. The exact marginal tax rates in that bill were as follows:

1. Single-filers:
    - \$0−\$10,000: 4.75%
    - \$10,001−\$100,000: 4.90%
    - \$100,001−\$250,000: 4.95%
    - \$250,001−\$350,000: 7.75%
    - \$350,001−\$750,000: 7.85%
    - \$750,001 and above: 7.95% on net income
2. Joint-filers:
    - \$0−\$10,000: 4.75%
    - \$10,001−\$100,000: 4.90%
    - \$100,001−\$250,000: 4.95%
    - \$250,001−\$500,000: 7.75%
    - \$500,001−\$1,000,000: 7.85%
    - \$1,000,001 and above: 7.95% on net income

B Data on Covid-19 cases in Illinois

My analyses use Covid-19 cases to explain support for progressive taxation. I pull data on the number of Covid-19 cases per zip code from the Illinois Department of Public Health. Because of the public health risks associated with in-person voting, the majority (59.5%) of voters cast their ballots before Election Day in 2020. To account for this, I only record cases that occurred before September 24, when early voting options were first made available to voters. If the IDPH reports no cases for a zip code before this date, I assign 2.5 cases, the midpoint between 0 and 5 (the minimum threshold at which cases are reported at the zip code-level).

Table A1 investigates sensitivity to the choice of cut-off date for counting Covid-19 cases. The first two columns report the same results from Table 1 in the main text. The next two columns count all cases before Election Day on November 3. Overall, the magnitude of the estimates is similar, although the coefficient is no longer statistically significant in the more restrictive model. The final two columns attempt to strike a balance between the two approaches; here, I calculate the number of pre-election cases as a weighted average of cases before early voting opens and the period between early voting and Election Day, with the weights corresponding to the proportion of voters voting early across the state. When using this measure, I again find results that are similar to those presented in the main text.

Table A1: Alternative Covid-19 case count dates

	% supporting progressive taxation (measured from 0 to 1)					
	Cases before early voting starts		Cases before Election Day		Weighted cases before Election Day	
Log cases	5.992*	0.480*	5.909*	0.280	6.028*	0.478*
	(1.496)	(0.168)	(1.564)	(0.204)	(1.526)	(0.199)
Observations	1,366	1,350	1,366	1,350	1,366	1,350
R^2	0.509	0.978	0.463	0.978	0.489	0.978
Covariates	No	Yes	No	Yes	No	Yes
County FE	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. Models include the following covariates: log population, population density, 2018 Democrat gubernatorial vote share, median household income, Gini coefficient, and the share of the population that is: under 18, over 65, Black, Hispanic, living in poverty, holding a bachelor's degree, as well as the percent working in the following industries: education, healthcare and social assistance; leisure and hospitality; and government. *p<0.05

C Details on matching precinct-level election results to zip codes

To link precinct-level returns to the zip code-level data on Covid-19 cases, I assign votes to each zip code using a geographic weighting scheme. The process is as follows:

1. Precinct boundaries are split along zip code boundary lines using the GIS "Union" function. For example, a precinct that is intersected by one zip code boundary would be transformed into two precinct "pieces."

2. I calculate the spatially-weighted number of voters in each precinct piece that voted in favour of a particular candidate or referendum outcome. The specific formula for this is:

$$\left[\frac{\text{Area of precinct piece}}{\text{Area of total precinct}}\right] \times \big(\text{Number of votes cast in precinct}\big)$$

   For example, if the "Yes" option received 100 votes in a precinct, and that precinct was split perfectly equally in two by a zip code boundary line, then the weighted number of "Yes" votes in each precinct piece would be 50.

3. I take the geographic centroid of each precinct piece and then spatially join it to its encompassing zip code area. In some cases, a centroid may not intersect with a zip code; these rare cases are dropped from the data.

4. I calculate the total votes cast for a particular candidate or option in a zip code by summing over the spatially-weighted vote totals for each precinct piece within that zip code. For example, if zip code Z contained 50% of Precinct A and 25% of Precinct B, then the total votes cast would be 50% of the votes in A plus 25% of the votes in B.

D Public opinion placebo test

In the main text, placebo tests were presented using a pooled sample of respondents from surveys in March 2019 and February 2020. Table A2 shows the estimated relationship between Covid-19 cases and support for the progressive tax proposal in that pooled sample alongside the estimates from each of the two constituent surveys separately.

Table A2: Public opinion placebo tests

	Support for progressive taxation		
	2019 & 2020	Mar. 2019	Feb. 2020
Log cases	0.001	0.006	−0.043
	(0.017)	(0.021)	(0.039)
Observations	1,068	785	283
R^2	0.312	0.312	0.445
County FE	Yes	Yes	Yes
Survey wave FE	Yes	No	No

Robust standard errors in parentheses. Models control for gender, age and its square, education, race, household income and party affiliation. $^{*}p<0.05$

E Covid-19 cases and job loss

Much of the theoretical literature suggests that any relationship between Covid-19 case counts and tax preferences should be driven by the pandemic's effects on voters' economic welfare. Unfortunately, there is no data available on zip code-level changes in economic conditions during the specific period under study.

To demonstrate that Covid-19 cases offer a reliable proxy for pandemic-induced economic disruption, I look at the relationship between case count and job loss at the county-level in Illinois. Using the Bureau of Labor Statistics' Quarterly Census of Employment and Wages, I calculate the average year-over-year monthly percentage change in a county's employment between February and October 2020 and regress it on the log total number of cases reported before Election Day in that county.

The results are reported in Table A3. The first model controls only for the county's log population, while the second model adjusts for a number of observable confounders and region fixed effects. Illinois only has 102 counties, so the estimates are statistically imprecise, but both point to a positive correlation between the Covid-19 case burden and job loss before the 2020 election. In the more restrictive model, moving from the 25th to 75th percentile county in terms of cases is associated with 2.8 p.p. decline in employment (p=0.19). To give a sense of the magnitude of this correlation, the median change in employment across all counties was -7.3 p.p. While these data cannot specifically show that job losses due to the pandemic affected support for progressive taxation, they do show that the Covid-19 case count is closely tied to a worsening of economic conditions in the year of the referendum.

Table A3: Covid-19 and job loss in Illinois counties

	Average year-over-year employment change (March to October 2020)	
Log cases	−0.022	−0.015
	(0.014)	(0.011)
Log total population	0.024	0.021
	(0.018)	(0.016)
Observations	102	102
R^2	0.045	0.310
Additional controls	No	Yes
Region FE	No	Yes

Robust standard errors in parentheses. Second model includes the following covariates: population density, 2018 Democratic gubernatorial vote share, median household income, Gini coefficient, and the share of the population that is: under 18, over 65, Black, Hispanic, living in poverty, holding a bachelor's degree, as well as the percent working in the following industries: education, healthcare and social assistance; leisure and hospitality; and private sector workplaces. *p<0.05

F Covid-19 era job losses by sector in Illinois

Using data from the Illinois Department of Employment Security's Current Employment Statistics Program, Figure A1 summarizes the year-over-year statewide percent change in employment by

sector during 2020. While all sectors experiences job losses after the pandemic began in March, it is clear that leisure and hospitality was hit the hardest. Between April and October, the average monthly change in employment from the year prior in this sector was 35%, compared to 9% in all other sectors.

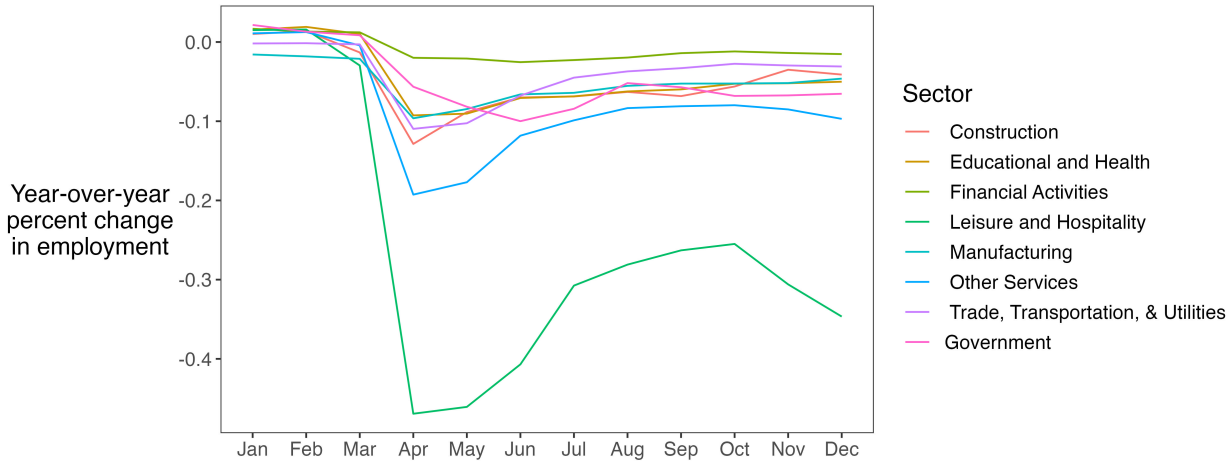

Figure A1: Year-over-year employment change by sector, Illinois (2020)

G Vulnerability index details

The vulnerability index is constructed using an inverse-covariance weighting (ICW) of three component variables: median household income (reversed), percent white (reversed) and percent working in leisure and hospitality. The correlations between the three variables are as follows:

	Median HH income	Percent white	Percent leisure
Median household income	1.00		
Percent white	0.08	1.00	
Percent leisure	−0.10	−0.23	1.00

Since the relationships between these variables are not particularly strong, the ICW scheme assigns roughly equal weights to each of the three components: median household income (37%), percent white (32%), percent leisure and hospitality (31%).

In the main text, I estimate conditional average treatment effects (CATEs) of Covid-19 cases

across deciles of the vulnerability index because there are several outlying values in the index that could lead to extrapolation. For completeness, Figure A2 shows the CATEs using a standard linear estimator, with the binned estimator superimposed for comparison. The conclusions are largely the same: areas with higher pre-pandemic vulnerability are those where the positive relationship between Covid-19 cases and support for progressive taxation is strongest. It is also worth noting that while this plot appears to indicate a strong negative association between these two variables in areas that were not especially vulnerable, there are too few observations to make firm conclusions about such a pattern in the data. (Neither of the two point estimates for the bottom 20% of vulnerability are statistically significant).

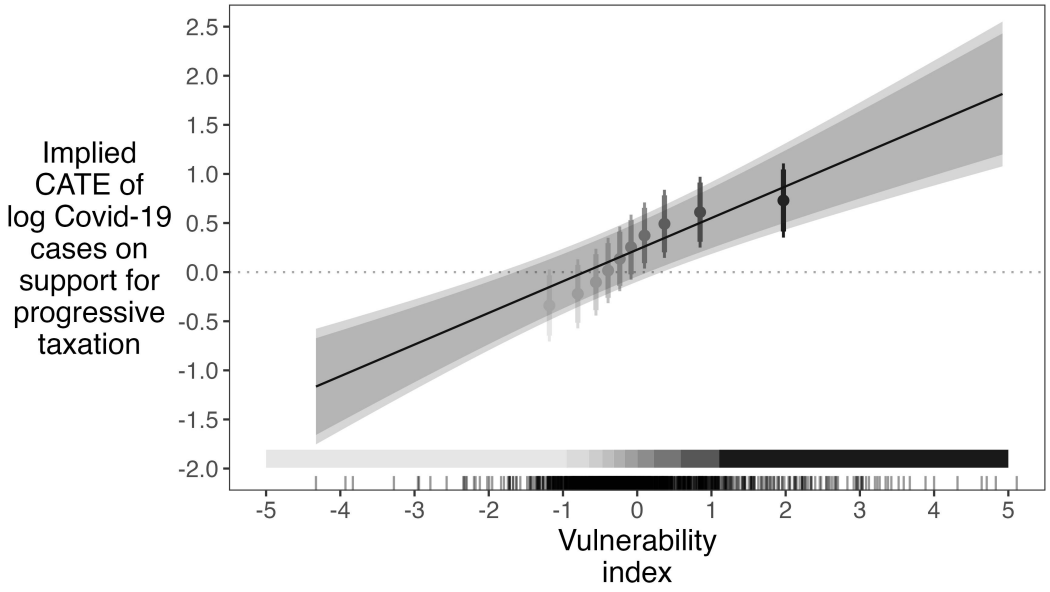

Figure A2: Association between Covid-19 cases and support for the progressive tax proposal by pre-pandemic economic vulnerability

Plot summarizes point estimates and 95% confidence intervals from an OLS model interacting the log Covid-19 case count with the pre-treatment vulnerability index, linearly and by binning the index into terciles. The model also adjusts for county fixed effects and the covariates listed in the notes to Table 1. Values on the x-axis are scaled in terms of index standard deviations. ($n = 1,220$).

One of the motivations for using an index variable is that aggregating similar patterns in the data across variables can increase power. To check that the patterns observed using the full index are not driven by one particular component variable, I re-estimate CATEs using the same interaction model framework as in the main text, except with the moderator variables switched to each of the individual

index components. Figure A3 displays the results. The patterns are generally as expected: areas that are richer, more white and with fewer residents working in leisure and hospitality are those areas where the positive relationship between Covid-19 cases and support for progressive taxation is least apparent.

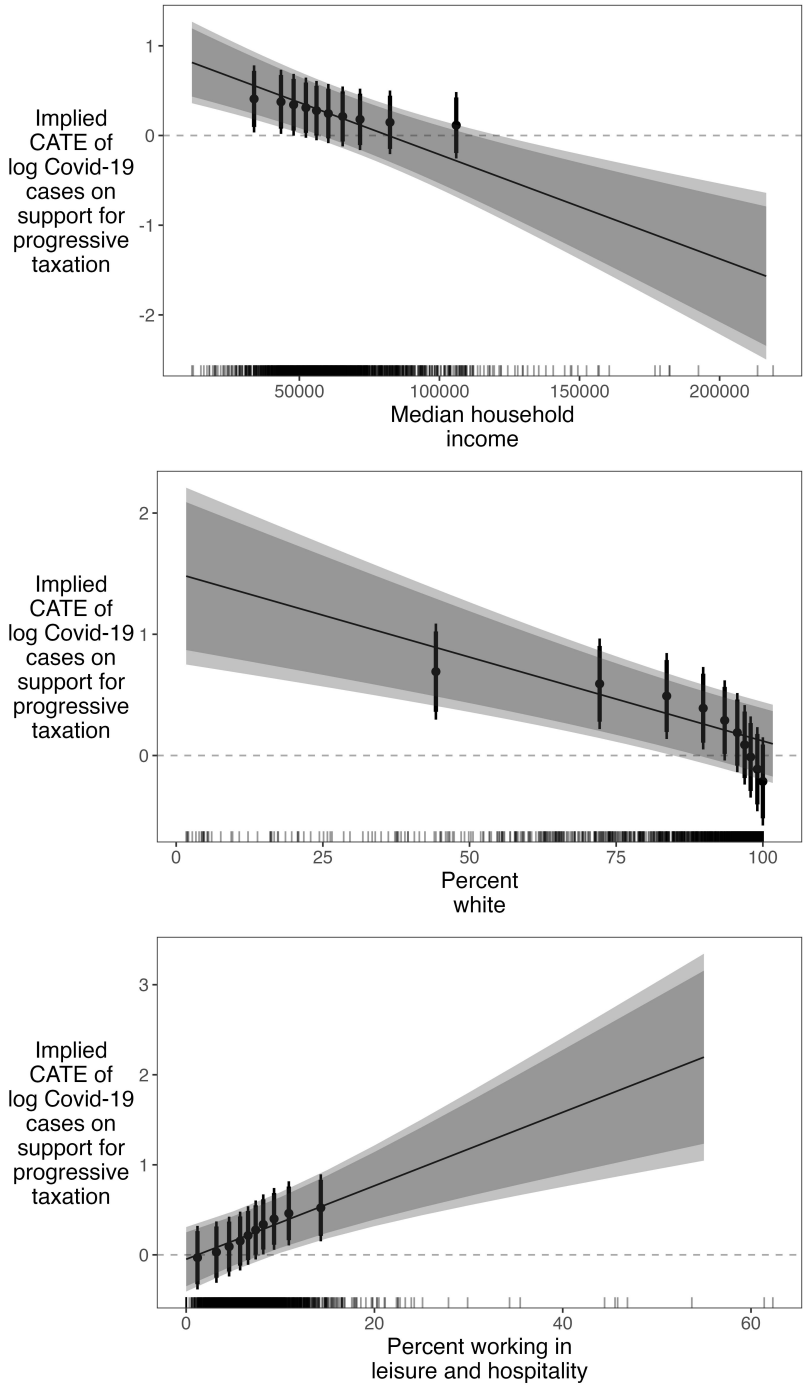

Figure A3: Association between Covid-19 cases and support for the progressive tax proposal by individual measures of pre-pandemic economic vulnerability

Plot summarizes point estimates and 95% confidence intervals from OLS models interacting the log Covid-19 case count with each pre-treatment vulnerability index component, linearly and by binning into deciles. The model also adjusts for county fixed effects and the covariates listed in the notes to Table 1. ($n \approx 1,220$).

H Robustness to covariate exclusion

The main analysis relies on a number of covariates to address observable sources of confounding. To test whether the main result is sensitive to the choice of covariates, I re-run the main model iteratively, dropping one covariate at a time. As Figure A4 shows, across all specifications, the coefficient estimate on the log Covid-19 cases variable is relatively stable and statistically significant, suggesting the estimated relationship is not an artifact of the choice of control variables.

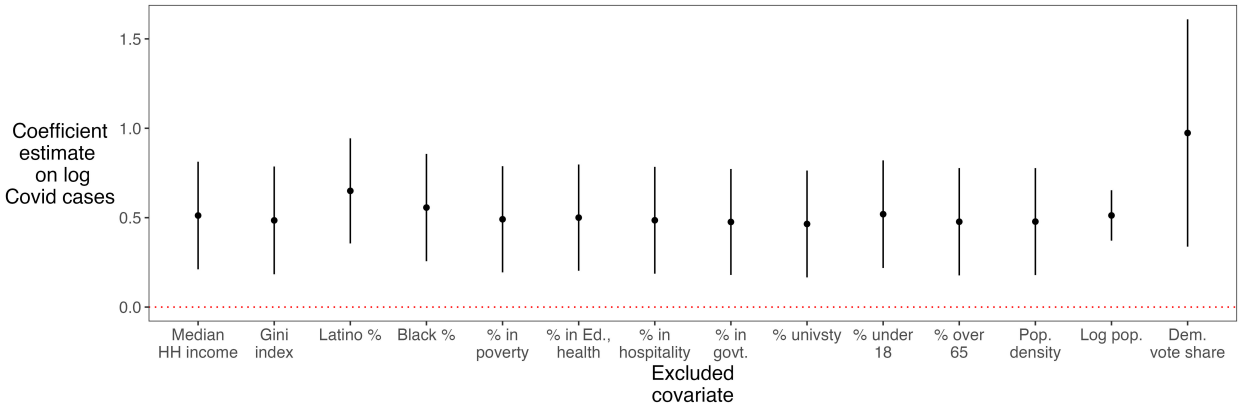

Figure A4: Robustness to covariate exclusion

Plot reports the coefficient estimates for the log case count variable from models including all covariates listed on the x-axis *except* the one below the point estimate.

I Robustness to county exclusion

To ensure that the main results are not driven by any one region of the state, I re-run my main model iteratively, dropping one county at a time from the sample. As Figure A5 shows, across all specifications, the coefficient estimate on the log Covid-19 cases variable is stable and statistically significant, suggesting the estimated relationship is not driven by any one county.

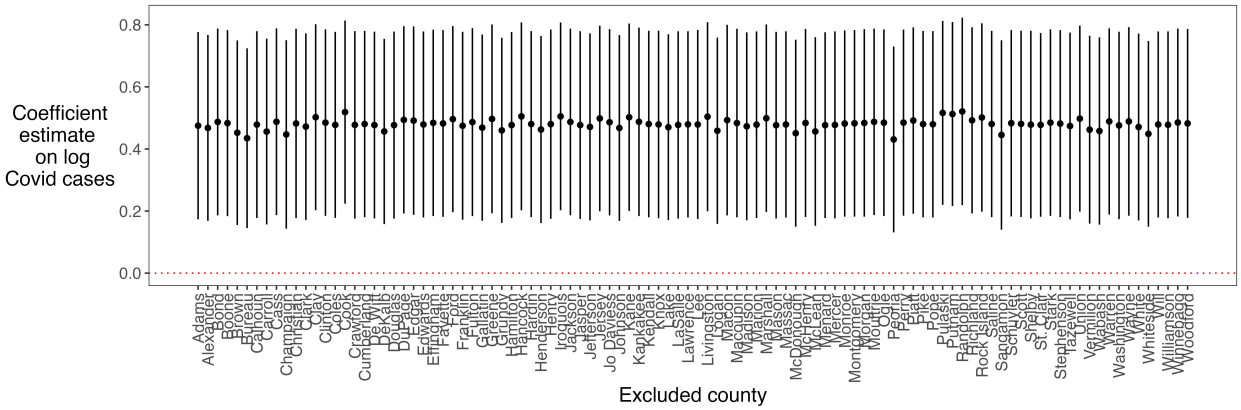

Figure A5: Robustness to county exclusion

Plot reports the coefficient estimates for the log case count variable from models including all counties listed on the x-axis *except* the one below the point estimate.

J Controlling flexibly for important confounders

To understand the most important confounders in the model of referendum support as a function of Covid-19 cases, I estimate the following two OLS models:

$$\log(\text{CovidCases}_{zc}) = \mathbf{X}_{zc}\gamma + \delta_c + \varepsilon_{zc}$$

$$\text{YesTax\%}_{zc} = \mathbf{X}_{zc}\gamma + \delta_c + \varepsilon_{zc}$$

where $\mathbf{X}_{zc}$ is the vector of control variables used in the main text and δ_c is a fixed effect for each county. All of the variables in $\mathbf{X}_{zc}$ have been centered on their mean and scaled by their standard deviation, so that the magnitude of each coefficient can be compared directly.

Figure A6 presents coefficient estimates from the two models, with the coefficients and confidence intervals from the first model on the x-axis and the coefficients and confidence intervals from the second model on the y-axis. The plot reveals five important predictors of voting behaviour and case counts: total population, the Democratic gubernatorial vote share in 2018, median household income and the percentage of the population that is Black and Latino.

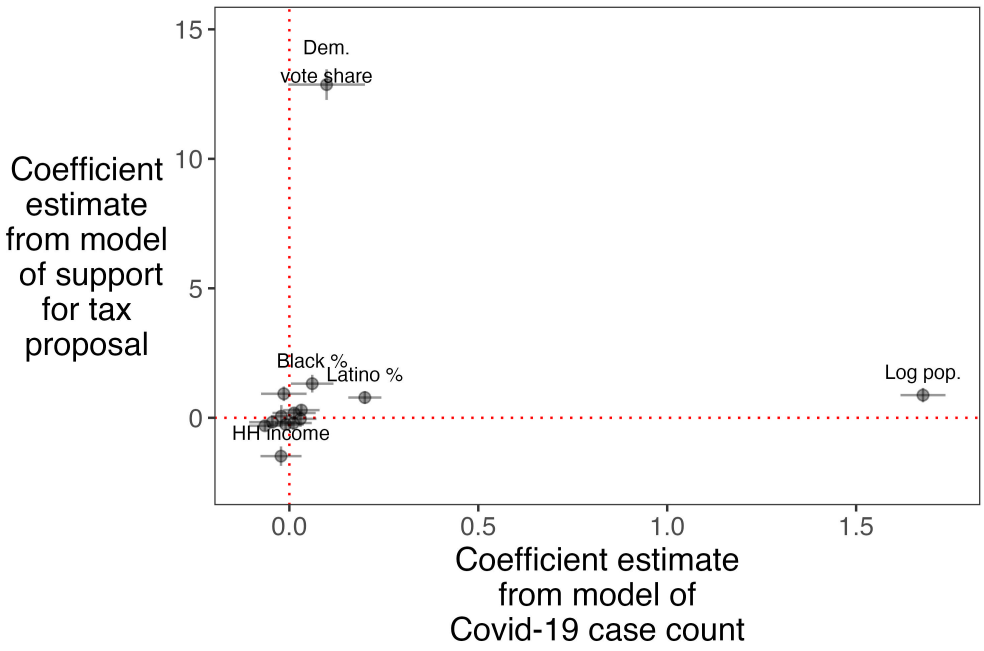

Figure A6: Determinants of Covid-19 cases and support for the tax proposal

Plot reports coefficient estimates from a model with the log number of pre-referendum Covid-19 cases in each zipcode as the dependent variable. Predictors have been standardized such that each coefficient captures a one-standard deviation change in the independent variable.

In the main analysis, I control for these confounders and all others shown in Figure A6 linearly. I now present those models in which the five most important confounders are controlled for more flexibly. While keep the rest of the model specification the same, I introduce higher order polynomials and splines for these variables to evaluate whether my main results are sensitive to how I adjust for these key covariates.

I report the results in Table A4 alongside the main estimates based on the linear control strategy; as the estimates show, the non-parametric adjustment strategy does not lead to markedly different conclusions.

Table A4: Flexible control specifications

	% supporting progressive taxation (measured from 0 to 100)			
Log cases	0.480*	0.404*	0.344*	0.341*
	(0.153)	(0.150)	(0.157)	(0.159)
Observations	1,350	1,350	1,350	1,350
R^2	0.978	0.980	0.980	0.980
Control specification	Linear	Quadratic	Cubic	Splines
County FE	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. Second model includes the following covariates: log population*, population density, 2018 Democrat gubernatorial vote share*, median household income*, Gini coefficient, and the share of the population that is: under 18, over 65, Black*, Hispanic*, living in poverty, holding a bachelor's degree, as well as the percent working in the following industries: education, healthcare and social assistance; leisure and hospitality; government. (Covariates marked with an asterisk are controlled for flexibly according to the model specification) *p<0.05

K Generalizability: Arizona's progressive tax referendum

Are the results from Illinois sensitive to some peculiarity of that state's political context? Like Illinois, Arizona held a referendum on progressive taxation in November 2020. Voters in that state were asked to approve a nearly identical taxation scheme, in which income over $250,000 ($500,000 for joint-filers) would be assessed a 3.5% surcharge on top of the existing 4.5% marginal tax rate. At the time of the referendum, Arizona already had a graduated income tax system, with four tax brackets; the ballot proposal would have effectively created a fifth bracket. Instead of being deposited in a general fund, the revenue for the new tax was to be specifically spent on teacher and classroom support staff salaries, teacher mentoring and retention programs, career and technical education programs, and the Arizona Teachers Academy. Unlike in Illinois, the initiative was opposed by Republican Governor Doug Ducey. The ballot measure was introduced by the Invest in Education Coalition, who collected signatures and sponsored the petition. Voters approved the proposal by a margin of 52 to 48%, but the plan was overturned in the courts as unconstitutional after

a lengthy legal battle.

This is a useful test case because, unlike Democratic Governor J.B. Priztker in Illinois, Arizona's Republican Governor Doug Ducey opposed the tax proposal. An alternative explanation for the patterns I find in Illinois is that a rally-around-the-flag effect drove voters especially affected by the pandemic to increase their support for the incumbent and, by extension, his tax policy (e.g. Bol, Giani, Blais, and Loewen, 2021). If this were the case, we should find the opposite effect in Arizona, where voting against progressive taxation would have offered a way to rally behind Governor Ducey.

To test for this possibility, I assemble zip code-level Covid-19 case data from the Arizona Department of Health (ADH) for the period up to October 7, 2020, when mail-in ballot were sent to voters. Because the ADH suppresses data on tribal reservations, the 7.8% of zip codes containing these geographies are excluded from the analyses. I take the logarithm of the case counts in each zip code (plus one to account for areas with zero cases). Referendum results are then matched to zip codes using the same spatial-weighting procedure as in Illinois (see Appendix C for details).

Using the same empirical strategy as in Illinois, I re-run the analysis on referendum returns in Arizona and present the results in Table A5. There are only about 25% as many zip codes in Arizona as in Illinois, and the coefficient estimates are accordingly much noisier, but a similar relationship is apparent: Covid-19 cases are positively associated with support for the progressive tax proposal. The first model reveals a bivariate correlation, while the remaining models introduce the same covariates and county fixed effects as above. The coefficient when controlling for these confounders is insignificant ($p = 0.08$), although the point estimate is very close to the coefficient in Illinois. I cannot rule out the null hypothesis that there was no association between Covid-19 cases and voting behaviour in Arizona's referendum, but the fact that the estimates from this case are similar in magnitude to the earlier results provides some indication that the findings from Illinois could apply more broadly.

Table A5: Covid-19 and support for progressive taxation in Arizona

	% supporting progressive taxation (measured from 0 to 1)	
Log cases	2.614*	0.624
	(0.274)	(0.355)
Observations	345	338
R^2	0.228	0.961
Covariates	No	Yes
County FE	No	No

Robust standard errors in parentheses. Second model includes the same covariates listed in Table 1 notes.
*p<0.05