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Access to Healthcare and Voting: The Case of Hospital Closures in Rural America

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We investigate how hardships affect rural politics, considering the case of hospital closures. In the last two decades, more than two hundred rural hospitals have closed their doors or drastically reduced their services. Drawing from resource models of voting, our hypothesis is that personal- and community-level deprivations brought about by hospital closures should reduce election turnout. Empirical tests pair geographic information on the location of open and closed hospitals with data from state voter files to create a panel of over 10 million rural residents for the 2016, 2018, and 2020 national elections. Results show that individuals whose nearest hospital closed prior to the proximate election were less likely to vote than their unaffected counterparts. These effects are strongest for older and lower-income residents, but they decay over time so that voting likelihood resembles a pre-closure baseline within 12 months.

INTRODUCTION

We explore the dynamics of political participation in the face of hardship in the context of an unfolding healthcare crisis in rural America (Douthit et al. 2015; Rust et al. 2009). Since 2005, more than two hundred rural hospitals have closed or severely reduced their available medical services (Kaufman et al. 2016). Experts estimate that one-third to one-half of remaining rural hospitals are in danger of closing in the near future (Chartis 2020). Where available, rural hospitals provide some of the only forms of available medical assistance and public health provision (Fields et al. 2001; McDonnell et al. 2013). Consequently, the closure of rural hospitals has numerous negative public health effects on impacted communities, including causing reduced medical care usage, increased travel times to services, longer waits for ambulances and emergency care, and, as a result of each of these factors, higher mortality risk (Gujral and Basu 2019; McCarthy et al. 2021; Miller et al. 2020).

Developing literatures in both American and comparative politics focus on the political ramifications of these kinds of experiences of rural deprivation, documenting the wide-ranging health and economic hardships of rural and working-class Americans (Case and Deaton 2020; Gest 2016; Mettler and Brown 2022; Metzl 2019) and the growing resentment and rightward bent of rural voters globally (Brown and Mettler 2023; Cramer 2016; Gest 2016; Huijsmans and Rodden 2024; Lunz Trujillo 2022; Munis 2022; Norris and Inglehart 2019). However, outside of qualitative work by sociologist Jennifer Silva (2019), much of this literature has focused on vote choice and support for populism. While such questions are of obvious importance, less attention has gone to the possibility that, rather than energizing rural constituencies, growing socioeconomic hardships may demobilize those most affected.

We weigh in by asking: how does experiencing a health-related hardship, as typified by hospital closures, affect voting participation? We know that incumbent politicians are often punished for economic downturns (Duch and Stevenson 2008; Lewis-Beck and Nadeau 2011; Nadeau and Lewis-Beck 2001) and that unemployment is linked to greater mobilization overall (Burden and Wichowsky 2014; Cebula 2017). However, those experiencing varieties of hardship nearer to elections are often less likely to turnout to vote (Estrada-Correa and Johnson 2012; Kam, Kirshbaum, and Chojnacki 2023; Kaufman and Hersh 2020; Schaub 2021)—consistent with long-standing research on the importance of material and social resources in shaping who participates in elections (Brady, Verba, and Schlozman 1995; Leighley and Nagler 2013; Rosenstone and Hansen 1993; Verba, Schlozman, and Brady 1995; Wolfinger and Rosenstone 1980). Accordingly, we argue that personal experiences associated with varieties of rural deprivation, as in the case of hospital closures, create demobilizing negative resource shocks.

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To test this, we use data from the L2 voter files for the 2016, 2018, and 2020 national elections (L2 2023).[1] These data include the home address of registered American voters, some key demographics, and whether they voted. We pair these data with geographic information available from the University of North Carolina's Cecil G. Sheps Center (UNC-Sheps 2023) on all the hospitals that closed between 2016 and 2020 and those that remained open during the same period. This allows us to calculate the turnout effects of experiencing a hospital closure prior to an election at an individual level. Hospital closures in these years took place only in rural areas (Kaufman et al. 2016), so we subset the L2 data corresponding only to voters residing in rural places. This results in a three-election panel dataset of 10.5 million individuals of which the population affected by a closure is a small fraction.

Utilizing regression models with individual-level fixed effects, we estimate the effect of hospital closures on turnout *within* individuals. Results reveal that those experiencing hospital closures are significantly less likely to vote, with individuals who are more likely to be negatively affected by a closure being the least likely to participate. Decreases in turnout range from less than 1% to around 3%, with the largest declines observed for the elderly and those with lower incomes. We also document the importance of the timing of hospital closures relative to elections on these demobilizing effects. Closures occurring closer to the election (1–6 months before) generate the largest reductions in turnout (4%–6%), but these effects decay quickly such that within 12 months affected individuals are back to voting at pre-closure levels, suggesting individuals revert to form politically following negative shocks. We also perform a placebo test showing that individuals whose nearest hospital is soon going to close but was still open at the time of the election were no less likely to vote than those who never experienced a closure. This result reassures us that it is the hospital closures themselves and not differential trends in local contextual factors, like economic decline, related to closures, that are driving the results.

Our data and research design allow us to make novel contributions to multiple academic subfields. We are able to advance the study of rural politics, showing that the effects of collapsing health infrastructure ripple outward into the political sphere, undermining rural citizenship and political participation, at least temporarily. This provides important context for existing narratives of the "uprising" of the aggrieved rural or working-class voter. These voters may be moving to the right politically while also facing demobilizing headwinds in the form of localized economic and health-related adversities. Additionally, we provide one of the largest design-based studies to date of the link between resource shocks and voting, estimating individual-level effects for over 10 million individuals across three national elections. Results are highly supportive of the long-standing idea that personal resources and consequently negative resource shocks matter a great deal for voting. Finally, our focus on hospital closures captures one of the most important, national-scale causes of healthcare hardship and access loss in the United States over the last 15 years (Kaufman et al. 2016), as well as a problem that is likely to worsen into the future.

HARDSHIP, VOTING, AND RURAL HEALTHCARE

Scholars have long argued that holding representatives accountable for new or worsening hardships is a fundamental purpose of elections (Achen and Bartels 2017; Key 1966). However, for elections to function as an accountability mechanism, aggrieved groups must turn out to vote, so the question of how adverse life circumstances mobilize or demobilize has normative implications for democracy (Key 1966; Leighley and Nagler 2013; Verba, Schlozman, and Brady 1995).

A lengthy literature dating back to at least *The American Voter* (Campbell et al. 1960) connects economic experiences to voting. Bad economic times drive people to the voting booth (Aguilar and Pacek 2000; Burden and Wichowsky 2014; Cebula 2017; Gomez and Hansford 2015) to electorally punish incumbent politicians at all levels of government (Benedictis-Kessner and Warshaw 2020). However, individuals directly experiencing a hardship are often found to be less likely to vote (Wu and Huber 2021). This includes financial calamities—the rapid onset of acute poverty (Schaub 2021) or home foreclosure (Estrada-Correa and Johnson 2012; Hall, Yoder, and Karandikar 2021; Shah and Wichowsky 2019)—and other personal hardships. Widowhood, for example, has been linked to massive (9%) and persistent reductions in turnout (Hobbs, Christakis, and Fowler 2014). Experiencing a traumatic event reduces turnout (Marsh 2023), as does dropping out of high school or becoming a parent (Kam, Kirshbaum, and Chojnacki 2023; Pacheco and Plutzer 2007).

Relatedly, some scholars have explored the links between health and voting, often revealing that health-related hardships, such as losing health insurance (Haselswerdt and Michener 2019) or the loss of a loved one to the ongoing opioid crisis (Kaufman and Hersh 2020), reduce turnout. Similarly, those who have physical disabilities are less likely to participate in elections (Schur et al. 2002). More directly related to our question here, Silva (2019) notes in her qualitative study of rural working-class Appalachians that those in bad personal health are substantially less likely to vote, a conclusion with empirical support in a few studies (Burden et al. 2017; Denny and Doyle 2007; Mattila et al. 2013).

In this area, scholars have generally argued that the connection between health and voting is driven by how the loss of "physical functioning…influence[s] participation in politics as an extension of how it affects daily tasks" and through a declining "ability to process information related to elections—the substantive information about the candidates and issues as well as important

[1] L2 is a national nonpartisan voter file provider.

procedural details about how to register to vote and cast a ballot, whether by mail or in person" (Burden et al. 2017, 168). Such arguments are grounded in resource models of voting, which argue that political participation is costly in terms of time and money so that those with fewer resources are less likely to turnout (Schlozman and Verba 1979; Verba, Schlozman, and Brady 1995). Along these lines, scholars have shown that poorer individuals are less likely to vote (Leighley and Nagler 2013), as are those that are socially isolated (Gerber, Green, and Larimer 2008). Moreover, because the people most harmed by public service reductions are already less likely to participate in politics due to their limited resources, we may expect negative participatory feedback loops brought about by retrenchment (Michener 2018). For example, Burch (2013) finds that experiences with the criminal justice system decrease the political participation of resource-constrained voters, leading to low levels of civic engagement in heavily policed neighborhoods.

The connection between adverse life events and voting is of growing relevance to the rural United States, which is in the midst of a multi-decade public services collapse on multiple fronts (Rodden 2024). Nowhere is this trend more evident than in the rapid decline in emergency medical and healthcare service providers. The causes of America's growing rural hospital closure problem are multifaceted. The sparse, older, less healthy, and less likely to be privately insured, populations of rural areas by their nature make them less profitable for the for-profit U.S. medical industry (Douthit et al. 2015; Rust et al. 2009; Wishner et al. 2016). Thus, as private-sector market forces have increasingly come to shape U.S. healthcare, rural medical services have dwindled (Mettler 2011; Morgan and Campbell 2011; Olson 2022; Reich 2014).

Research across the social sciences has focused on the consequences of rural deprivations (health as well as economic) on the political attitudes of rural populations, generally finding growing support for populist candidates (Case and Deaton 2020; Cramer 2016; Gest 2016; Hochschild 2018; Huijsmans and Rodden 2024; Norris and Inglehart 2019). Much of this work has assumed some degree of political activation where hardships drive rural populations to the polls in anger. But qualitative work by Silva (2019) suggests that at minimum these patterns are not universal and that instead these types of hardship may often have demobilizing effects. Thus, while questions of vote choice are of obvious importance, we lack a firm understanding of how worsening socioeconomic conditions in rural areas affect the decision to turnout in the first place.

In fact, there are multiple reasons to think that hospital closures may depress turnout. The loss of a hospital in rural communities has multiple deleterious consequences for the health, economy, and ultimately the civic wellness of rural areas. On the health front, rural hospitals provide essentially the only form of medical services and public health provision in the communities fortunate enough to still have them (Fields et al. 2001; McDonnell et al. 2013). As a result, rural hospital closures eliminate local, publicly guaranteed primary care health services for the poor and uninsured, in addition to emergency medical services for the broader community (Rust et al. 2009). Furthermore, the closure of rural hospitals can cause reduced medical care usage due to increased travel times to the next closest services as well as longer wait times for ambulances and emergency care, causing significantly worsened health and higher mortality risks for matters ranging from car crashes to heart attacks (Gujral and Basu 2019; McCarthy et al. 2021; Miller et al. 2020; Ramedani et al. 2022).

Hospital closures can also reduce the free time of those affected, which may result in less cognitive resources to devote to political questions. Many residents depend on local hospitals to manage chronic health conditions through regular doctor visits (Fields et al. 2001; McDonnell et al. 2013). We know that voting turnout is sensitive to increases in distances to polling places (Brady and McNulty 2011; Clinton et al. 2021), so increasing the amount of time required for travel to receive regular medical attention might have a similarly demobilizing effect. Moreover, the sudden need to seek out information about the availability and location of new healthcare facilities is another cognitively taxing (but important) task those affected by a closure must perform.

Outside of these health-specific effects, hospital closures also mean massive job losses for already struggling communities. Scholars have shown in a variety of instances that hospital closures lead to spikes in local unemployment and lower incomes for residents of affected communities (Alexander and Richards 2023; Holmes et al. 2006; Malone et al. 2022; Vogler 2020). These effects are likely especially pronounced in rural areas that lose their hospitals due to the limited alternative options for medical employment. Further exacerbating these effects, the healthcare industry has become the largest employment sector in rural areas outside of the government, with over 10% of rural Americans working in healthcare or social assistance (Davis et al. 2022; Doeksen and Schott 2003; Winant 2021). Consequently, the closure of a nearby hospital may be a powerful psychological blow to already vulnerable communities, leading to social withdrawal and not mobilization. Along these lines, research has highlighted the important community-building aspects of hospitals in rural areas, which can service as anchor institutions in these places (Farmer, Prior, and Taylor 2012; Koh et al. 2020; McAreavey 2022).

When a rural hospital fails, an entire community's health, economic, and social well-being suffers. We therefore argue that experiences like hospital closures likely demobilize those affected by creating resource-depleting hardships on multiple fronts. People might lose their jobs, their healthcare provider, their health may suffer, the civic fabric of their community might decline, and they may need to spend more time commuting to receive medical care. These demobilizing effects should be larger for older individuals, who are more reliant on medical services (Getzen 1992), and for lower-income individuals, who are more reliant on

hospital emergency rooms for medical care (Fields et al. 2001; McDonnell et al. 2013; Rust et al. 2009).[2]

In terms of the persistence of any demobilizing effects, scholarship has demonstrated that people are generally resilient and find ways to adapt to the deprivations they face. A lengthy psychological literature on hedonic adaptation speaks to these abilities, finding that people tend to return to baseline affective states soon after external shocks (Diener, Lucas, and Scollon 2006; Solomon 1980). In the context of voting behavior, White (2019) shows that proximate criminal justice exposure has a demobilizing effect, but only if it occurs shortly before an election. In the case of hospital closures, it may be that after individuals have had time to find new jobs or new healthcare providers (i.e., the resource shock has run its course), then voting returns to a pre-closure baseline.

Hypothesis

We present a formal model that captures our hypothesis of how a resource shocks may affect voter behavior. In the case of hospital closures in rural regions, we anticipate that withdrawal via an economic or personal loss, as called for by resource models of voting (Brady, Verba, and Schlozman 1995), is the most likely outcome.

Drawing from Riker and Ordeshook (1968), let there be a large number of voters N indexed by i. The voter's expected utility of voting is $U_i = P_iB_i - C_i$, and is affected by their benefit B_i, net cost C_i, and perceived pivotality P_i. The benefit B_i is assumed to be positive, and the cost can be positive or negative (as it includes any sense of political duty or enjoyment of the act of voting). The perceived pivotality is nonnegative and does not have to follow rational choice (Kawai, Toyama, and Watanabe 2021; Quattrone and Tversky 1988). Suppose the utility of not voting is 0. The voter decides to participate if the benefit outweighs the cost. The observed turnout is the number of voters whose utility of voting is greater than zero: $T = \sum_N 1[U_i > 0]$. Finally, suppose the cost of voting C_i is influenced by their resources $m_i \geq 0$, which can capture monetary or mental capacity.

When would a voter withdraw from participating? Suppose $\frac{dC_i}{dm_i} \leq 0 \; \forall i \in N$. In this case, the cost is weakly decreasing in resources. We would predict a downward shock (e.g., hospital closure) would increase the cost of voting and the overall expected utility of voting would decrease. Thus, we would expect to see a decrease in voter turnout with sufficient variation in the cost across voters. In this case, turnout T changes when there is a decrease in m_i for at least one voter. Let $\vec{m}$ be the vector of resources, and let $\overrightarrow{m'}$ be the same vector with at least one i with strictly lower resources: $\langle \vec{m}, \vec{1} \rangle > \langle \overrightarrow{m'}, \vec{1} \rangle$. This yields $T(\vec{m}) \geq T(\overrightarrow{m'})$.

To summarize, the shock of a hospital closure reduces affected individuals likelihood of voting due to the increased costs of participation and, thus, reduced utility from voting. Voters with lower levels of resources to handle the shock—in the case of hospital closures those who are older or have lower incomes and, thus, depend more directly on the hospital—face even greater costs to turnout following the closure. In the same way, less-resourced individuals are also less able to be counter-mobilized in pursuit of policy solutions due to the costs associated with electoral participation in the face of a closure.

DATA AND DESIGN

We use data from the University of North Carolina's Cecil G. Sheps Center (UNC-Sheps 2023) that records information about hospital closures, focusing on hospitals that fully closed their doors between 2016 and the end of 2020.[3] From the Sheps data, we extract the geographic location and timing of each hospital closure. Additionally, we gather from the Sheps Center information on all open hospitals as of the end of 2020, including acute care hospitals. Figure 1 plots the location of every hospital closure in the United States between 2016 and 2020 along with county-level population densities. As can be seen, southern states like Texas and Tennessee have experienced the most hospital closures during this period, and, generally, closures are taking place in more sparsely populated locations.[4]

To measure election participation, we use the voter files for the 2016, 2018, and 2020 national elections provided by L2, a commercial vendor that obtains registration and voting data from state administrative records. From these, L2 builds a panel dataset by constructing a voter ID number that links individuals across time while dropping invalid or duplicate entries caused by registrants moving or dying. Each observation corresponds to a registrant-election pair and includes: (1) the home address where they registered to vote in that election, (2) whether or not they actually voted, (3) their turnout history dating back to 2010, and (4) their party registration. L2 does further research on each registrant to provide estimates of annual household income, race, and age.[5]

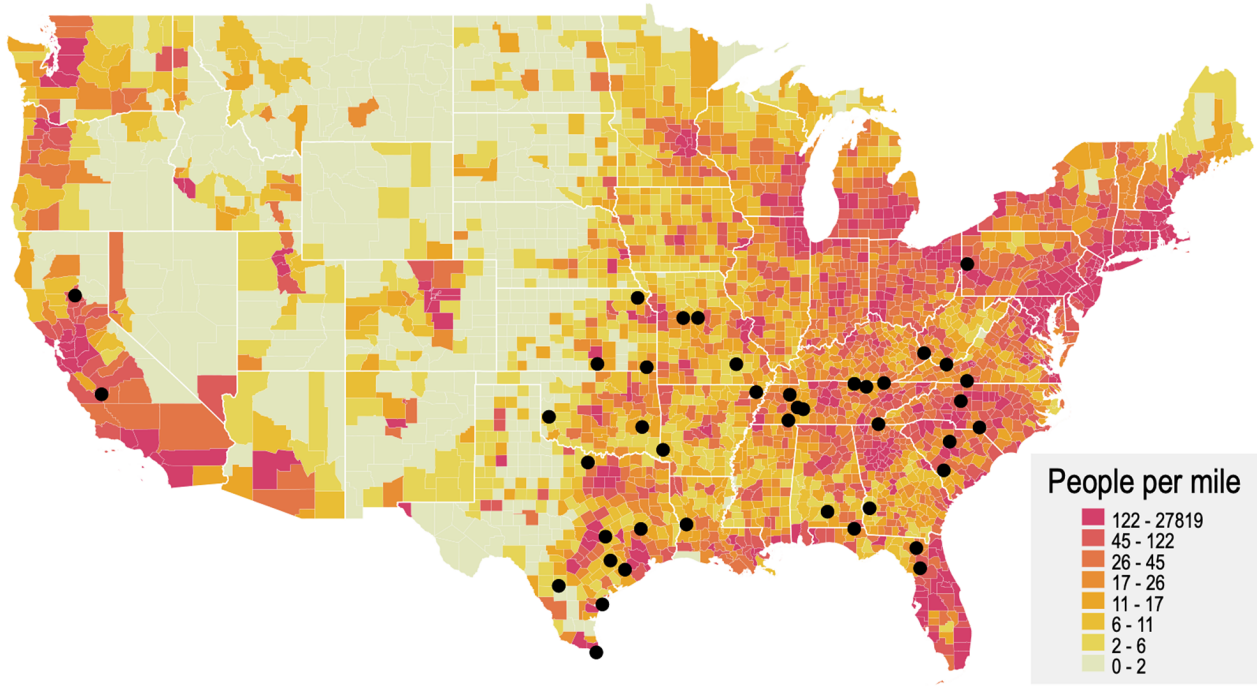
[2] Ideally, we would be able to estimate the effects of a closure on the turnout of those who worked at the hospital, as this is another group that would clearly be strongly affected. However, we are not aware of data that would allow us to explore this possibility.

[3] We limit these data by eliminating children's hospitals, psychiatric hospitals, cancer specialty hospitals, and Indian Health Service facilities to focus on the loss of hospitals that provide more general and emergency services.

[4] During this period, no hospitals closed in Alaska or Hawaii.

[5] Research documentation (Cox, Epp, and Shepherd 2024) for this study is available at the APSR Dataverse, https://doi.org/10.7910/DVN/DCOT4D. We are unable to post the voter files as L2 is a commercial vendor and requires a license. Researchers interested in obtaining the voter files used in this study can contact L2: https://l2-data.com/datamapping/.

FIGURE 1. County Population Density and U.S. Hospital Closures 2016–2020



Note: Figure plots people per square mile and the location of hospitals that closed between 2016 and 2020. *Data source*: UNC-Sheps (2023).

All of the hospital closures since 2016 have taken place in rural parts of the country, so we drop observations corresponding to people registered in non-rural places.[6] We then merge the voter files with the data on hospitals by matching each registrant to their nearest open and nearest closed hospital using the geographic coordinates associated with each address.[7] Registrants are considered "affected" if their nearest hospital was a hospital that closed prior to the subsequent election. For example, if a registrant's nearest hospital closed in February 2016, then they would be among the affected population in the 2016, 2018, and 2020 elections. If their nearest hospital closed in September 2018, they would be unaffected for the 2016 election and affected in 2018 and 2020. Of course, a limitation is that we know nothing about the actual hospital usage of the people that make up our data. An individual may commute to their second-nearest hospital for healthcare or to work (or never visit a hospital at all). Our variable is therefore a measure of those who are most likely to be affected by a closure.

To isolate the effect on voting of switching from the unaffected to the affected population, we create a balanced panel by holding individuals constant across the voters files corresponding to each election, matching people based on their voter ID and zip code and dropping registrants if they moved between zip codes between the 2016 and 2020 elections. This specification allows us to precisely estimate the effect of hospital closures on voting at the individual level. Registrants whose nearest hospital closed but subsequently moved and voted in another location for the next election would no longer meet the definition of being affected. Similarly, if a registrant moved into an affected address at some point after the nearest hospital closed, they would not meet the definition.[8] This results in a dataset of 31,219,515 observations corresponding to 10.5

[6] Specifically, we use the USDA Economic Research Service Rural–Urban Continuum Codes developed by the federal government (https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/), dropping registrants living in regions designated with codes 1(Metropolitan) to 6(micropolitan). This leaves registrants living in "small towns" and "rural regions." All of the observed hospital closures took place in these areas, and no new primary care hospitals with emergency services opened to replace them between 2016 and 2020. While we could add data corresponding to urban registrants to our study, none of these individuals would be exposed to a hospital closure, so this would give us more precision than is justified by the real-world variance that is driving our results.

[7] We measure straight-line distance between two points, which is different than driving distance or commute time. Calculating these latter metrics is challenging, as roads and traffic patterns change over time, and is consequently not feasible for tens of millions of individuals dating back to 2016. However, in rural areas, where there is much less traffic, the correlation between straight-line distance and driving time is high, and consequently straight-line distance is often used in hospital studies (Boscoe, Henry, and Zdeb 2012).

[8] Ideally, we would be able to track people who stayed in the same location but let their registration expire, as this is a key measure of civic participation, but we are unable to distinguish between these individuals and those who exit the voter files for other reasons. In the Supplementary Material, we estimate multinomial regressions that treat voting and exiting the sample (i.e., having one's registration lapse) as separate outcomes (see Supplementary Table D7). Having one's nearest hospital close is not a robust predictor of exiting the sample, but effects with regard to voting are consistent with those presented below.

million individuals evenly distributed across three election cycles. Of this, a small fraction is affected by a closure: 0.32% in 2016, 0.63% in 2018, and 1.27% in 2020.

Expectations are that switching to the affected population will demobilize, and we use the vast population that is never affected as a control. To test these expectations, we estimate regressions that predict if an individual will vote controlling for the year of the election, using fixed effects for individuals, and clustering standard errors at the individual level.[9] The individual-level fixed effects absorb many of the elements that are known to be major predictors of voting, such as civic efficacy and socioeconomic status.

TABLE 1. The Effect of Hospital Closures on Voting

	Model 1	Model 2
Affected	−0.038** (0.000)	−0.002* (0.001)
2016	—	—
2018	−0.105** (0.000)	−0.106** (0.000)
2020	0.009** (0.000)	0.009** (0.000)
Constant	0.772** (0.000)	0.772** (0.000)
FE Voter ID	✗	✓
N	31,219,515	31,211,401
Adjusted R^2	0.014	0.57

Note: Standard errors are clustered on voter ID. *$p < 0.05$; **$p < 0.01$.

RESULTS

Table 1 shows the results of two regression models predicting turnout. The first model is a simple regression predicting the effect of being affected on voting controlling for only the year of the election. Here, we find that switching from the unaffected to the affected population is associated with a 3.8% decrease in the likelihood of voting. Substantively, this is a large effect. For comparison, note that the model predicts that people are 10% less likely to vote in the 2018 midterm election than the 2016 presidential election. In other words, the upper-bound effect of hospital closures on reductions in turnout is about 60% of the well-documented estimated decline in turnout between presidential and midterm elections (A. Campbell 1960; J. Campbell 1991; McDonald and Popkin 2001).

But there are many things about individuals that are relevant to voting behavior and these go unaccounted for in model 1, so in model 2 we add individual-level fixed effects. Not surprisingly, the R^2 in this model is much larger than in model 1. Once again, the coefficient for being exposed to a hospital closure is negative and statistically meaningful, but the size of the coefficient is much smaller. Switching to the affected population is associated with a 0.2% reduction in the likelihood of voting. In all, results are supportive of our hypothesis: hospital closures depress voting for those affected, if only modestly.

We proceed by exploring heterogeneity around these baseline results. First, we look at demographic subgroups. Our theoretical expectations are based on the idea that hospital closures will create tangible hardships—either economic or physical—that increase the costs of political participation. Such hardships should be especially acute for more vulnerable populations such as the elderly, who are more dependent on healthcare services, and low-income individuals. If hospital closures also cause demobilization through demoralization and political apathy (i.e., decreasing the expected utility of voting), then these effects might be larger among Democrats, who are thought to be more politically and socially isolated in rural regions (Van Duyn 2021; Gimpel et al. 2020). To investigate, we re-estimate model 2 from Table 1 after subsetting the data along these demographic dimensions. Figure 2 shows the coefficients associated with the affected variable (see Supplementary Table A2 for full regression results).

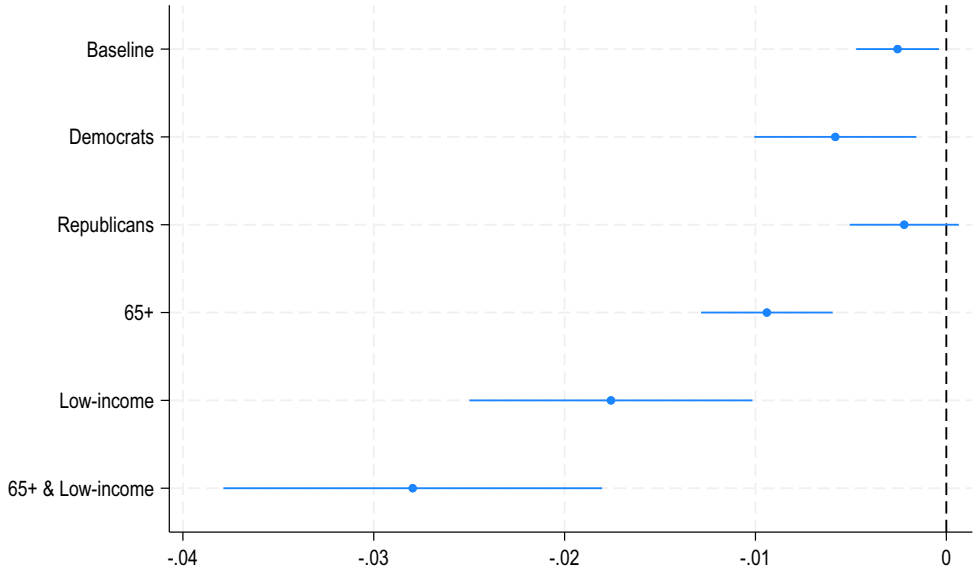
The baseline model displays the coefficient shown in model 2 of Table 1. When we subset to Democrats, we find larger effects for hospital closures: Democrats are about 0.5% less likely to vote compared to 0.2% for Republicans, although this difference is not statistically meaningful.[10] Those over the age of 65, who, on average, are more likely to be reliant on hospital services, are also less likely to vote after a hospital closures as compared to the baseline. However, the largest effects are for lower-income individuals who are much less likely to vote. Combining these groups, we find that older individuals of lower socioeconomic status are almost 3% less likely to vote following a hospital closure than are those of a similar age and income but unaffected.[11]

[9] Bertrand, Duflo, and Mullainathn (2014) recommend that users of difference-in-difference estimators cluster standard errors at the geographic level of treatment. In our case, treatment status is calculated based on the distance of each registrants' address from a hospital. This means that the geographic level of treatment is unique for almost every individual in the data. However, multiple voters can live at the same address, so in the Supplementary Material, we re-estimate our baseline model, clustering standard errors at the distance to the nearest hospital in 2016. This makes almost no difference to the results (see Supplementary Table A4).

[10] In the Supplementary Material, we further subset the data, finding larger effects for low-income, elderly, and white Democrats, which suggests that being a Democrat is not simply a stand-in for these other traits (see Supplementary Table F9). We also re-estimate these models on the full sample using interaction terms instead of subsetting the data. Results are consistent with those shown in Figure 2 and reveal statistically meaningful interactive effects. While Democrats are not statistically different from Republicans, they are less likely to vote after exposure to a hospital closure than are registrants associated with a third party or no party (see Supplementary Table F10).

[11] There are different ways to group individuals: rich Republicans, older Republicans, poor Democrats, etc. Figure 2 is meant only to look at some key groups where we have theoretical expectations about hospitals, resource shocks, and voting. We have not found any group that increases their turnout after exposure to a hospital closure.

FIGURE 2. Coefficients Characterizing the Effect of Hospital Closures on Voting by Demographic Subgroup



Note: Figure plots the effect of the "affected" variable on voting for six separate models. The "Baseline" model includes everyone and subsequent models subset by demographic group. Each model includes individual-level fixed effects and indicator variables for the election year. Full results are shown in Supplementary Table A2.

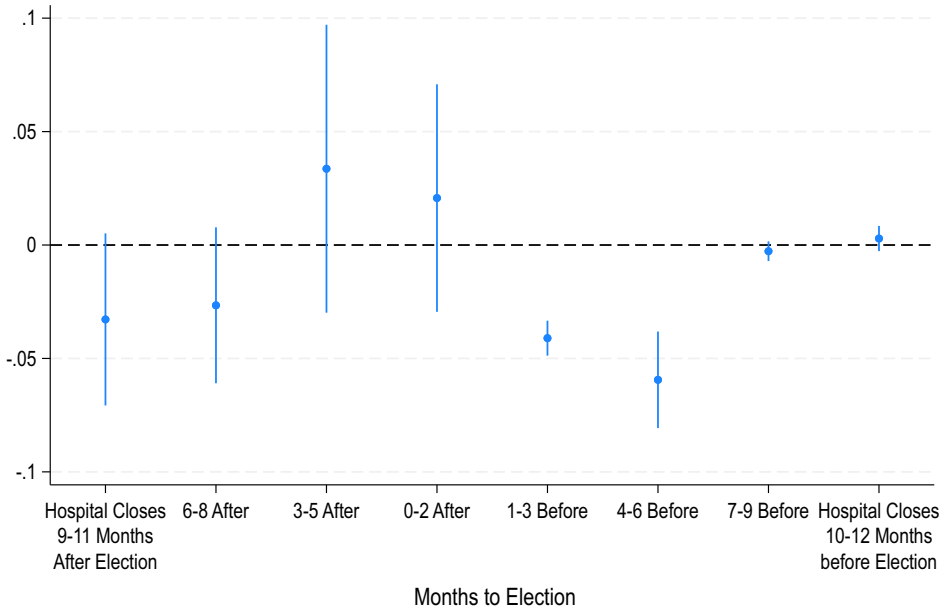
These effects are all highly consistent with a resource model of voting behavior and our formal theoretical expectations whereby external shocks drive up the costs or lower the expected utility of voting. Those with lower incomes and older individuals (i.e., the people most likely to depend on the local hospital for their healthcare) are the ones mostly likely to be demobilized. Thus, although the experiences of rural deprivation may be pushing voters rightward globally (Gest 2016; Huijsmans and Rodden 2024; Norris and Inglehart 2019), the same kinds of experiences may actually demobilize rural constituencies.

Exploiting Time: Confounding Factors and Effect Duration

The primary confounder to our research design and threat to inference is reverse causality. Hospital closures are more likely to take place in sparsely populated and economically depressed communities (Chatterjee, Lin, and Venkataramani 2022). By including fixed effects for individuals in our models, we control for baseline differences in community-level factors, but we are unable to account for differences in longitudinal trends across communities. For rural places, these trends may be quite similar. Most rural hospitals are struggling financially and many are thought to be on a knife's edge for closure (Chartis 2020). Still, a concern is if effects thought to be about hospitals are being conflated with a general over-time decline in civic participation among residents of down-and-out places. For insight on this possibility, we look at the timing of hospital closures to compare the voting behavior of individuals who will be affected by a closure to those who have already been affected. The logic is that hospital closures are plausibly exogenous to elections, so we can reason that the communities of individuals who will soon be affected by a closure are not that different from those who have just been affected. Thus, observed differences in turnout between these groups can likely be attributed to the hospital closure itself.

Figure 3 shows the results of eight models that group people according to when they were or will be affected by a closure relative to the election, starting with those whose nearest hospital closed 9–11 months after an election and proceeding in 3-month increments to those whose nearest hospital closed 10–12 months before the proximate election. To illustrate, individuals coded 1 in the model labeled "Hospital Closes 9–11 Months After Election" have not yet been affected because their nearest hospital will close sometime 9–11 months after the election. For example, if someone's nearest hospital closed in September 2017, then they would fall in this category for the 2016 election. In this model, people who are never affected are coded 0 and those who are affected (their nearest hospital closed before the election) are dropped from the regression, as are those who will be affected at some other point after the proximate election. Individuals coded 1 in the model labeled "0–2 after" have not been affected at the time of the election but will have their nearest hospital close shortly thereafter, either later in November, December, or January. Individuals coded 1 in the model labeled "1–3 before" have had their nearest hospital close within 3 months of the election, and so forth (see Supplementary Table A3

FIGURE 3. Coefficients Characterizing the Effect of Hospital Closures on Voting by Timing to the Election



Note: Figure plots the effect of the "affected" variable on voting for eight separate models that group people according to when they were or will be affected by a hospital closure. Each model includes individual-level fixed effects and indicator variables for the election year. Full results are shown in Supplementary Table A3.

for the full regression results). An important qualifier is that grouping individuals based on temporal distance to the election means that estimates are made from small numbers of affected individuals, and even smaller numbers of hospital closures.

Results suggest that hospital closures are not simply a stand-in for a general civic withdrawal among individuals living in depressed places. For not-yet-affected individuals, there is no statistically meaningful difference in the likelihood of voting relative to the never-affected population. (Although the point estimates and standard errors for these models are large.) This includes individuals who will be affected shortly after the election takes place. But those whose nearest hospital has just recently closed (within 3 months) are 4% less likely to vote. Given the short time period separating individuals in these two models, it is unlikely that community-level changes independent of the hospital closure are behind the difference of around 7% in predicted turnout.

Those whose nearest hospital closed within 4–6 months are 6% less likely to vote. These are substantively large declines in turnout in the modern literature on the effects of local events on voting behavior. However, these declines also quite temporary. Individuals whose nearest hospital closed 7–12 months before the election are back to voting at levels that are statistically indistinguishable from the never-affected population. This amount of time is plausibly how long it takes individuals to recover from or adapt to the shock of something like a hospital closure. Consistent with this idea, the U.S. Bureau of Labor Statistics finds that people remain unemployed for around 5 months on average before finding a new job.[12] We also note that living in an economically depressed place may prepare residents for the possibility of a hospital closure, so the bounce-back time may be shorter than from resource shocks that are unexpected. Though the effects we have documented have occurred in the confines of national elections, similar effects are likely in the many local elections that occur with staggered frequency across the United States (Anzia 2013). Local hospital closures happening within 1–6 months of any of these regularly occurring local elections likely significantly demobilize the most negatively affected individuals.

Robustness Tests

We also report the results of several other robustness tests in the Supplementary Material probing various aspects of our results. These include further tests to eliminate concerns that individuals experiencing hospital closures are demographically or otherwise different than those not experiencing closures, whether the effects of closures varies or depends on distances to next available medical services, how the decision to register prior to voting may complicate or influence our turnout findings, and finally exploring whether omitted time-varying factors may explain our results. Across

[12] https://www.bls.gov/news.release/empsit.t12.htm.

each of these tests, we find consistent effects of rural hospital closures on voter turnout.

First, to explore how well we accounted for individual-level demographic differences using individual-level fixed effects, we use propensity score matching to pair affected with unaffected individuals on the basis of personal attributes—turnout history, age, race, gender, and household income—as well as county-level unemployment. With this test, we may better approximate an experimental design by creating a control group that never had their nearest hospital close but is otherwise similar to the affected population. Following matching, we then run difference-of-means tests for turnout between the matched groups separately for each election, finding that affected individuals are between 1% and 3% less likely to vote than their unaffected counterparts. Results are shown in Supplementary Table C6.

Second, we investigate how differential distances to an open hospital affect voting. We do so by interacting the affected by closure variable with the logged distance in kilometers to the nearest open hospital. Affected individuals who have to travel farther to access a still-open hospital may be even less likely to vote since they face even greater hardship. But this is not what we find. For the unaffected population, there is a negative and statistically meaningful relationship between hospital distance and voting, but for affected individuals the relationship is not distinguishable from zero. See Supplementary Table B5 for these results.

Third, we examined how voter registration decisions may complicate our findings. The decision to register to vote is itself an act of political participation. This raises the possibility that individuals are more likely to select out of the sample after experiencing a hospital closure. To explore this possibility, we estimate multinomial regressions predicting if a person exits the sample (i.e., has their registration to lapse) and if they vote. Results can be found in Supplementary Table D7. Exposure to hospital closures does not reliably predict exiting the sample but continues to show a demobilizing effect on voting. Thus, we can be reasonably sure that the effects of closures are limited to turnout, reinforced by the relatively short duration of effects documented in the previous section

Finally, we explore different ways to assuage concerns about time-varying unobserved heterogeneity beyond the individual level. First, we regress voting on exposure to a closure while including county-year specific means of all the individual covariates available in the voter files (distance to nearest hospital, political party, gender, race, income, age, and voting history) as well as annual county-level educational attainment, which we draw from the American Community Survey. Then, we repeat this analysis at the zip code level (see Supplementary Table E8). Results from both models are consistent—being affected by a hospital closure reduces turnout in the subsequent election. In fact, the demobilizing effects are larger when we model the relationship in these ways than those we report in Table 1.

Overall, our findings appear to be robust to a variety of empirical specifications and potential sources of confounding. Experiencing a hospital closure leads to an immediate demobilization, especially by the most negatively affected and least resourced individuals. After 6 months or so, individuals revert back to their baseline levels of political participation, suggesting considerable resilience and adaption by voters facing hardships. Further, these results do not appear to be driven by factors beyond the experience of the shock of a closure itself.

DISCUSSION AND CONCLUSION

Scholarship from across the social sciences has drawn attention to a resentful fury that has taken hold in rural areas of the world as a result of personal suffering brought about by diminishing economic opportunities and worsening healthcare outcomes (Case and Deaton 2020; Cramer 2016; Gest 2016; Metzl 2019; Norris and Inglehart 2019; Silva 2019). Much of this scholarship has centered on the rightward shift of these populations and has suggested a rural uprising against political elites fueled by grievances. We provide important context for these narratives, arguing that experiencing these kinds of hardships may demobilize, rather than energize, rural voters.

Empirical analysis is consistent with these expectations, revealing that in comparison to unaffected rural residents those who experience a hospital closure are less likely to vote in a subsequent election. Moreover, we find that individuals who are more likely to suffer as a result of the loss of a hospital are the ones whose probability of voting is most diminished: voters over the age of 65, a typically highly participatory group (Campbell 2002), and those with lower incomes. We further show that it is only closures that occur before the election that decrease turnout. Placebo results of post-election closures reveal no changes in estimated turnout. However, these effects are short-lived and within 12 months the turnout of individuals whose nearest hospital closed is not statistically distinguishable from the turnout of the unaffected population. These results are the largest-scale, plausibly causal, evidence to date of the idea that the collapse of health infrastructure depresses political participation.

Our results also have significant practical importance. As rural healthcare has worsened globally as a result of forces like the opioid epidemic and COVID-19 (Case and Deaton 2020), the loss of rural hospitals and the undercutting of civic participation in response imply that as conditions worsen for rural residents they are less likely to mobilize politically to improve their conditions, perhaps leading to further limitations to care. The demobilizing effects we observe in the immediate aftermath of a hospital closure are substantively large. In this way, we show that the loss of a rural hospital harms the health and, at least temporarily, the democracy of a rural America already struggling on both of these dimensions—problems likely to continue and worsen in the years to come. The worse matters get in these communities, especially surrounding elections, the more the composition of the electorate is to be

constituted by those less affected by or already resourced enough to weather social problems and health hardships. These results imply that elections may provide a less clear or loud signal for policy change from voters most in need of help.

Left open for future research is the question of who these voters blame for these experiences and how, if at all, losing a rural hospital influences attitudes toward the Affordable Care Act (ACA) or health policies more generally. While some work has suggested that voters spread blame widely for their health experiences (McCabe 2023), considerable work suggests that personal experiences are consequential for influencing health policy attitudes specifically, as well as anti-incumbent voting behavior (Benedictis-Kessner and Warshaw 2020; Hopkins 2023; Lerman and McCabe 2017). For example, Hobbs and Hopkins (2021) show individuals with worse experiences under the ACA in the form of higher health costs tended to have more negative attitudes about the policy. A related question is how similar hospital closures are to other types of resource shocks that are known to occur in rural places such as job losses in the coal or other manufacturing industries. Unlike these industries, which sell to nonlocal buyers, the financial viability of a hospital is closely tied to the economic health of the surrounding community. A hospital closure may therefore be less unexpected, which might give people more time to prepare, allowing them to recover faster than from resource shocks brought about by nonlocal forces.

Future work should explore these potential effects. We are also curious how public health collapses affect turnout in regions with robust two-party competition and dense social networks. It is possible that mobilization would be more likely in these conditions, but data on hospital closures, perhaps tellingly, do not permit a test of this possibility. We consider this idea in more detail in Section G of the Supplementary Material. Along these lines, future studies could also explore the importance of formal and informal groups and mobilization efforts in influencing rural voters' abilities to bounce back from these types of external shocks. Our findings paint an optimistic picture on this front, showing that rural voters return to baseline levels of voting a few months after a hospital closure. But, as the overall socioeconomic landscape of many rural places continues to deteriorate, there may be limits to this resiliency and some groups may be less able to adapt than others. Crucially, many more rural hospitals are expected to close in the near future. Finally, though rural voters may be angered and inclined to support right-wing candidates as of form of "backlash" to socioeconomic hardships (Baccini and Weymouth 2021; Norris and Inglehart 2019), resource models of participation and our results here suggest that those most affected by such hardships may not be the ones registering their anger at the polls. Future work should explore whether those more negatively affected by resource shocks were themselves more likely to vote in anger, or simply more resourced individuals nearby leveling their own concerns.

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit https://doi.org/10.1017/S0003055424001035.

DATA AVAILABILITY STATEMENT

Research documentation for this study is openly available at the American Political Science Review Dataverse: https://doi.org/10.7910/DVN/DCOT4D. Voting data come from the L2 Political Academic Voter File. L2 is a commercial vendor, and their data are restricted use for those with license access. Researchers interested in these data can contact L2 for details on gaining access (https://l2-data.com/datamapping/).

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AUTHOR CONTRIBUTIONS

The authors are listed in alphabetical order and contributed equally to this study.

CONFLICT OF INTEREST

The authors declare no ethical issues or conflicts of interest in this research.

ETHICAL STANDARDS

The authors affirm this research did not directly involve human participants.

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