Public Choice
https://doi.org/10.1007/s11127-025-01260-x

Fifty-four thousand deaths, zero electoral impact

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Received: 23 September 2024 / Accepted: 15 January 2025
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Abstract
The February 2023 earthquake in Turkiye resulted in 54,000 fatalities and over $100 billion in economic losses. We examine whether this catastrophic event influenced incumbent-party support in the subsequent election. In contrast with previous researchers, we find no significant effect on voter turnout or the incumbent party's vote share, even after accounting for population displacement and infrastructure damage. We argue that this null effect is due to several factors: effective electoral management policies that reduced voting costs despite significant population displacement; a compressed timeline between disaster and elections, which constrained politically motivated aid distribution; extreme political polarization, which led the public to filter their interpretation of the disaster response through partisan lenses; different information flows in state-controlled media and social media; and offsetting electoral responses across regions. Our results offer valuable insights for policy makers, political scientists, and economists studying the political consequences of natural disasters.

Keywords Natural disaster; earthquake; election

JEL Classification D72 · Q54 · R11

1 Introduction

On February 6, 2023, two powerful earthquakes with magnitudes of 7.7 Mw and 7.6 Mw struck southeastern Turkiye and western Syria. Given the devastating impact in Turkiye alone—53,537 fatalities, the displacement of millions, and economic losses exceeding $100 billion—this earthquake ranks among the most destructive ever in the world.

This study estimates the impact of that earthquake on voter behavior in Turkiye. We analyze six elections—five before the earthquake and one after—to assess changes in voter turnout and the incumbent party's vote share following the disaster. Our research employs district-level panel data sets encompassing all of Turkiye and uses the synthetic difference-in-differences (SDID) approach as the primary empirical method.

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Our findings show that, surprisingly, the earthquake did not significantly affect voter turnout or the incumbent party's vote share. This null effect persists even when we account for the earthquake's severity as measured by post-disaster migration patterns or the extent of building collapses. The surprising result can be attributed to five factors: (1) policy interventions reduced the barriers to voting caused by the disaster; (2) the short (three month) timeline between disaster and election limited the government's ability to politicize aid; (3) extreme political polarization led voters to interpret events through partisan lenses; (4) the government's control over both traditional and social media channels shaped how different groups accessed and interpreted disaster information; and (5) similar decreases in incumbent-party votes across both affected and unaffected regions made it difficult to isolate earthquake-specific effects.

The relationship between natural disasters and voter behavior is a dynamic research area. A key factor in this relationship is whether voters associate the disaster with the incumbent party. Studies suggest that natural disasters can influence voting patterns even when they are not directly linked to the governing party (Achen & Bartels, 2004; Fowler & Hall, 2018). Voters may assess the government's competence based on its post-disaster response policies (Ashworth et al., 2018). Consequently, effective relief efforts can improve the incumbent party's electoral performance (Cerqua et al., 2023). However, preventive measures typically do not yield electoral benefits for the government (Healy & Malhotra, 2009; Morvan & Paty, 2024; Rubin, 2020).

While post-disaster policies are one of the primary factors influencing incumbent parties' electoral performance, media visibility following a disaster can also benefit those in power (Masiero & Santarossa, 2021). Increased media presence allows incumbent parties to publicize their actual or proposed policies, shaping voter perceptions. This heightened visibility serves as a channel through which the governing party can influence public opinion regarding its disaster-response efforts.

The literature also emphasizes the importance of the time interval between a disaster and subsequent elections (Rubin, 2020). Voters may initially trust the government to deliver on its policy promises made in the immediate aftermath of a disaster. However, as time progresses and the promises remain unfulfilled, support for the incumbent party may decrease. Consequently, the electoral impact of a disaster tends to diminish as time elapses (Bechtel & Hainmueller, 2011; Cole et al., 2012; Kondoh & Miyazaki, 2024).

Our study makes several contributions to the literature. First, as demonstrated in Appendix Table A1, previous papers have arrived at conflicting results regarding the impact of natural disasters on incumbent-party votes. Our research demonstrates a null effect and identifies the mechanisms that explain this outcome.

Second, our study addresses migration bias, a critical factor often overlooked in disaster-impact analyses. Natural disasters typically trigger substantial population movements from affected areas to unaffected areas. We account for this potential bias by examining changes in the birthplace composition of regional populations before and after the earthquake, providing a more accurate assessment of the disaster's impact on voter behavior.

Third, we use a comprehensive building-collapse data set that quantifies the earthquake's impact. This data set, created by classifying millions of buildings according to their damage levels, allows for more precise measurement of the earthquake's effects and enables us to differentiate voting behavior among earthquake victims based on the severity of damage experienced.

Our study's final contribution lies in its focus on Turkiye, addressing a gap in the literature highlighted by Rubin (2020). Most research exploring the relationship between natural disasters and voter behavior has centered on mature liberal democracies, such as the

Table 1 Descriptive Statistics

Variables	Definition	Unit	Mean (1)	S.D (2)	Min (3)	Max (4)	N (5)
Incumbent Party's Vote Share	Percentage of valid votes received by the incumbent party	%	0.59	0.20	0.02	0.98	5,820
Voter Turnout	Percentage of registered voters who cast a ballot in the election	%	0.85	0.06	0.57	0.99	5,820
Total Votes Cast	Total number of ballots cast	count	57.28	92.89	1.29	717.03	5,820
Valid Votes	Total number of legally cast and counted ballots in the election	count	48.19	79.04	0.87	653.33	5,820
Earthquake Intensity	Measure of the severity of an earthquake shown on the Modified Mercalli Intensity scale	scale	3.94	1.77	0.00	8.40	970
Temperature	Average temperature during the election	°C	17.51	5.57	2.40	33.91	5,820
Precipitation	Total rainfall during the election	cm	59.40	62.11	0.00	556.87	5,820
Population	Total number of residents	count	83.05	134.60	1.51	978.01	5,820
Illiteracy Rate	Percentage of the illiterate population	%	0.04	0.03	0.00	0.21	5,820
Elderly Dependency Ratio	Ratio of elderly dependents	%	21.23	11.40	3.55	70.47	5,820
Average Household Size	Average number of people per household	count	3.40	0.93	1.98	8.58	5,820
Earthquake Area-Born	Percentage of the population born in earthquake regions	%	13.14	54.05	0.00	814.50	9,700
Property Transactions	Total number of property transactions	count	0.87	1.16	0.01	11.51	9,690
Night-time Light Intensity	Measure of night-time light intensity	$nW/cm^2/sr$	3.93	12.17	0.04	125.05	9,700

°C is centigrade, cm is centimeter, nW is nanoWatts, sr is steradian. S.D. represents standard deviation; Min and Max indicate the minimum and maximum values, respectively; and N denotes the total observations. Except for the average household size, all the count units are in thousands

United States, Germany, and Sweden (see Appendix Table A1). By examining Turkiye, whose electoral system coexists with a political structure in which the president and the incumbent party are effectively the same, we provide valuable insights into how the impact of natural disasters on voter behavior varies across governance systems.

This study consists of eight sections. Section 2 provides context on Turkiye's earthquake and electoral system. Section 3 details the data sources used. Section 4 explores the relationship between natural disasters and voter behavior. Section 5 discusses our empirical strategy. Section 6 presents our findings while Sect. 7 discusses the mechanisms. We conclude by summarizing our key findings and deriving implications.

2 Earthquake and elections in Turkiye

2.1 Earthquake

On February 6, 2023, two powerful earthquakes struck the southeastern region of Turkiye, specifically the Pazarcık and Elbistan districts of Kahramanmaraş Province. The first quake, measuring 7.7 Mw, occurred at 4:17 a.m. and was followed by a 7.6 Mw earthquake at 1:24 p.m. On February 20, an earthquake of 6.4 Mw magnitude shook the Yayladağı district of Hatay Province. Between February 6 and May 6, the area experienced over 33,000 aftershocks of varying magnitudes (AFAD, 2023; Cetin et al., 2024).

The earthquake affected much of Turkiye and its population. Eleven provinces were directly struck, home to 14 million people—16% of Turkiye's total population. Official figures indicate that approximately half of the country's nearly 4 million refugees also resided in the affected area. The affected region accounted for fully 14% of the national housing stock and contributed 10% to GDP (PSB, 2023).

These earthquakes rank among the world's most catastrophic in terms of fatalities and property destruction (Fig. 1). They were the deadliest and most damaging earthquakes

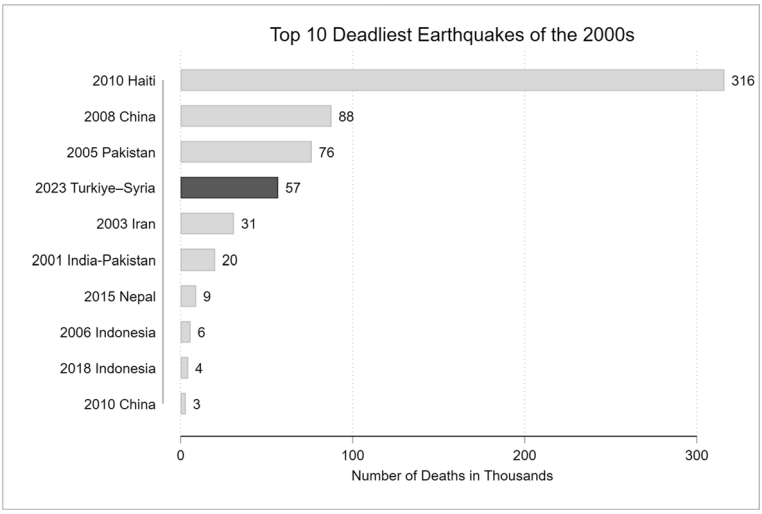


Fig. 1 Comparison of the Deadliest Earthquakes Across the Globe *Note* This figure compares earthquakes after 2000 across countries by their total fatalities. Source of the data: NGDC/WDS (2024)

in the Turkish Republic's century-long history (PSB, 2023). The first earthquake weakened building structures, while the second earthquake caused the widespread collapse of these compromised structures (Karray et al., 2024). Official figures indicate there were 53,537 fatalities and 107,204 individuals sustaining injuries (PSB, 2024). The earthquakes also inflicted an economic loss of $103 billion (PSB, 2023).

In the immediate aftermath, authorities implemented numerous measures to address the crisis. Within two days, the government declared a state of emergency in the 11 affected provinces. The initial response focused on providing shelter: 1 million tents were dispatched to the region, accommodating 2 million people. State dormitories housed half a million individuals, while hotels and guesthouses provided shelter for an additional 700,000 people. In the first phase of the response, more than 3.5 million people were evacuated, with the government covering travel expenses for 1.5 million of them (PSB, 2024).

In the days following the earthquake, the authorities established container cities, using 200,000 containers to house 700,000 people. Each displaced individual received a card loaded with 3,000 Turkish lira for immediate needs, and 50% more in 2024. The government gave additional money to homeowners and tenants. Relocation and bereavement support were provided to affected families. The total allocation of earthquake relief funds in 2023 amounted to 1.1 trillion Turkish lira, equivalent to 4.5% of GDP (PSB, 2024).

A crucial policy initiative in the earthquake's aftermath was a comprehensive assessment of building damage. Authorities evaluated over 2 million structures. The assessment revealed that 10% of the inspected buildings either had collapsed, were at risk of collapse, or had sustained moderate to heavy damage (PSB, 2024).

Following the damage assessment were a reconstruction effort and provision of housing for earthquake victims. The president initially pledged to build 650,000 houses in total, with 319,000 to be completed within the first year (Anadolu Agency, 2023a, 2023b). However, he fell short of this promise. By the end of the first year, only 46,000 houses were completed. Before the 2024 local elections, an additional 30,000 houses were built, bringing the total to just 76,000 (Anadolu Agency, 2024a, 2024b).

2.2 Elections

Turkiye employs distinct electoral systems for general and local elections. General elections select national policy makers, including the president and members of parliament. Local elections select regional administrators such as provincial and district mayors, municipal council members, and mukhtars. Referenda represent a third type of democratic process.

Since 2018, Turkiye has had a presidential system. The president, who typically leads the incumbent party, and the parliamentary majority have the same party because the president maintains party affiliation rather than serving as an independent figure. Both presidential and parliamentary elections occur every five years. Each province elects a number of members of parliament proportional to its population using the D'Hondt method. However, parties must secure at least 7% of the national vote to gain parliamentary representation.

Turkiye's parliament includes multiple parties beyond the incumbent Justice and Development Party led by President Recep Tayyip Erdoğan. These parties fall into two categories: opposition parties, such as the Republican People's Party; and coalition

partners, such as the Nationalist Movement Party. Coalition partners collaborate with the incumbent party, dividing parliamentary seats in their constituencies.

Referenda are another mechanism to gauge public support or opposition to governmental initiatives, particularly for constitutional amendments. The president and incumbent party may seek direct public endorsement of proposed changes. During referenda, the incumbent party and its coalition partners advocate the government's position, while opposition parties campaign against the government's stance.

Between 2010 and 2024, the country held 11 general and local elections. Occasionally, early elections are called in response to economic or political crises. Of Turkiye's 85 million inhabitants, approximately 61 million are eligible voters. Turkiye has among the highest voter turnout among OECD and EU countries, with over 85% of eligible voters casting ballots (V-Dem, 2024).

This study concentrates on the six general elections held between 2014 and 2023. Several factors justify excluding local elections. First, general and local elections are not directly comparable because while coalition partners typically collaborate in general elections, they may field competing candidates in local elections. Second, local elections primarily assess the performance of regional administrators rather than indicating public support for against the incumbent party. Voters may vote for candidates out of satisfaction with the local administration, regardless of its party affiliation. Last, general elections more accurately reflect voter views on national policies related to national disasters such as earthquakes. Therefore, this research focuses on how a nationwide disaster influenced national-level policy preferences.

2.3 Institutional failures in the earthquake response

The earthquakes revealed systemic vulnerabilities and institutional weaknesses that amplified the natural disaster. Deficient building was central to the devastation, with a 2019 construction amnesty having permitted 438,000 property owners to legalize noncompliant structures in earthquake-prone regions (New York Times, 2023). Though Turkiye implemented strict building codes after the 1999 earthquake, enforcement was weak, partly because construction projects were awarded to politically connected companies with minimal oversight (Guardian, 2023).

The earthquake response revealed critical institutional shortcomings when compared to the 1999 disaster response. Military deployment dropped significantly, with only 7,500 personnel mobilized in the first 48 h of the 2023 earthquake versus 65,000 in 1999. The poorly executed centralization of disaster response under AFAD (the Disaster and Emergency Management Authority), hampered by organizational constraints and political appointments, contributed to these deficiencies (Foreign Policy, 2023a, 2023b). In the crucial 48–72-h window after the earthquake, professional rescue teams and equipment proved inadequate across the affected regions, forcing families to conduct independent rescue operations using private resources (BBC, 2023; Foreign Policy, 2023a, 2023b; Reuters, 2023a, 2023b).

The government's restriction of social media platforms, including Twitter, during initial response efforts drew sharp criticism. These restrictions, undertaken to combat disinformation, impeded emergency communication and rescue coordination, which relied heavily on the platforms (NetBlocks, 2023; Washington Post, 2023a, 2023b).

Construction projects by government-affiliated companies faced scrutiny for disregarding safety standards. The systematic weakening of independent oversight

mechanisms undermined accountability in infrastructure development (Washington Post, 2023a, 2023b).

The 2023 earthquakes exemplify the severe deficiencies in Turkiye's disaster-preparedness and institutional-response capabilities. These systemic weaknesses greatly magnified the natural disaster's impact.

3 Data sets

3.1 Election results

The election-results data were obtained from the Supreme Election Council, Turkiye's institution responsible for organizing elections (YSK, 2024a, 2024b). This study examines six elections between 2014 and 2023: the 2014 presidential election, the June and November 2015 parliamentary elections, the 2017 referendum, and the parliamentary elections (but not the presidential elections) of 2018 and 2023.

From this data set, we create two primary variables. The first is the voter turnout rate, calculated by dividing the number of actual voters by the number of registered voters. The second variable is the incumbency party's vote share. We calculate this based on votes for the incumbent party and its election-specific coalition partners. For instance, in 2015, the incumbent coalition comprised the Justice and Development Party and the Nationalist Movement Party, while in 2023, it included the Justice and Development Party, Nationalist Movement Party, New Welfare Party, and Great Unity Party (Appendix Table A3). Our supplementary analysis indicates that the addition of two parties in 2023 does not significantly affect the results. This approach ensures consistent operationalization of the incumbent-party concept across elections. We then compute the incumbent party's vote share by dividing the total votes received by the incumbent party and its partners by the number of valid votes cast. In Fig. 2, we show raw means of voter turnout and incumbent-party vote shares across earthquake and other regions.

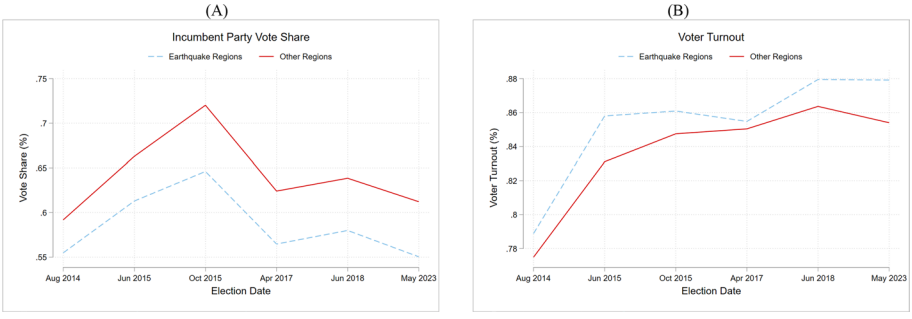


Fig. 2 Raw Means of Incumbent Party Vote Shares and Voter Turnouts Across Treatment Groups *Note* These figures show the raw means of incumbent party vote shares and voter turnouts across treatment groups. Earthquake regions are defined as areas where the Modified Mercalli Intensity Scale is greater than or equal to 6

3.2 Earthquake intensity

The earthquake-intensity data come from the US Geological Survey in the form of shake maps (USGS, 2023a, 2023b; USGS, 2023a, 2023b). Shake maps consist of Modified Mercalli Intensity (MMI) values, ranging from 1 to 12, which indicate the degree of shaking intensity experienced by humans. The Kahramanmaraş earthquake reached the maximum MMI value of 12 (Hancılar et al., 2023). MMI is also used in other papers examining the relationship between earthquakes and electoral outcomes (Cerqua et al., 2023).

On February 6, 2023, the two earthquakes struck nine hours apart, resulting in two distinct shake maps. We merged these files to derive a single MMI value for each district and selected the highest MMI value at the district level. These consolidated values were used to create the treatment and control groups for our empirical strategy. Figure 3 shows the district-level earthquake intensity based on these combined MMI values.

3.3 Building damage

Following the earthquake, the Ministry of Environment, Urbanization, and Climate Change conducted rapid inspections of millions of buildings, categorizing them as undamaged, slightly damaged, moderately damaged, heavily damaged, to be demolished, or demolished. These classifications were made public, allowing building occupants to object to their assigned category (MEUC, 2023). The resulting comprehensive damaged-building data set comprises over 2 million records and includes variables such as building identification numbers and detailed address information (province, district, neighborhood, and street). It also contains data on objection status. However, the data set presents challenges, including data-entry errors, duplicate entries, and building-classification changes resulting from objections.

To address the challenges, we cleaned the data. First, we removed observations lacking building ID numbers and eliminated duplicate entries. We then aggregated observations by building-damage class and district to determine the number of damaged buildings per district. The district-level damaged-building variable was calculated by summing the number of demolished, emergency demolished, and severely damaged buildings, then

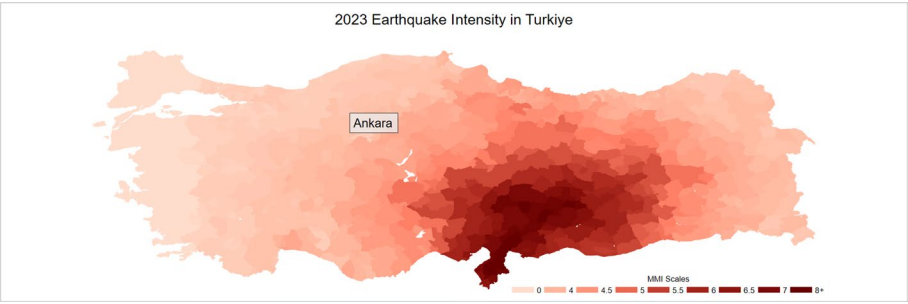


Fig. 3 Modified Mercalli Intensity for the 2023 Earthquake in Turkiye *Note* This figure shows the MMI for the 2023 Earthquakes in Turkiye. On February 6, 2023, there were two earthquakes; we take the maximum value of the MMI for a given district. The data source is USGS (2023a, 2023b); USGS (2023a, 2023b)

normalizing this figure by the district's population. This refined variable was subsequently used to create various treatment and control groups for our analysis.

3.4 Earthquake-area-born populations

Millions of people evacuated the region following the February 6, 2023, earthquake, with a substantial number returning before the elections. For our purposes, individuals who initially migrated and subsequently returned before the election do not pose a significant concern. However, those who relocated permanently and cast their votes in other regions present a challenge. Although affected by the earthquake, these individuals were in unaffected areas at election time. Consequently, they are incorrectly categorized in the control group instead of the treatment group, potentially skewing the results.

No publicly available data set provides district-level information on migrants from the earthquake region. To address this limitation, we focus on individuals' birthplaces within each district to account for what we term *migration bias*. The Turkish Statistical Institute offers data on the number of individuals born in the 11 earthquake-affected provinces, categorized by district (TurkStat, 2024). We aim to analyze temporal changes in the population of earthquake-region-born individuals residing in unaffected areas.

We calculate the mean and standard deviation of changes in earthquake-region-born populations across all Turkish districts for the decade preceding 2023. A district is classified as a recipient of earthquake migrants if its increase in the number of earthquake-region-born residents exceeds the mean plus two standard deviations of such residents in the pre-2023 period. We then define our treatment group to include both the original earthquake-affected regions and these migration-recipient districts. This approach allows for a more comprehensive analysis that accounts for population displacement effects.

3.5 Temperature and Precipitation

Climate may also affect voter behavior (Artés, 2014; Eisinga et al., 2012; Hoffmann et al., 2022). We analyze temperature and precipitation data during election months to account for this. Information on these variables comes from the Copernicus ERA5 monthly data set (Hersbach et al., 2023). ERA5, the fifth-generation global climate and weather reanalysis data set produced by the European Centre for Medium-Range Weather Forecasts, spans from 1940 to the present and integrates model data with global observations. Our analysis focuses on two parameters: 2 m temperature and total precipitation. The 2-m-temperature parameter measures air temperature 2 m above land, sea, or inland water surfaces, originally in Kelvin (K), which we converted to degrees Celsius by subtracting 273.15. Total precipitation represents the accumulated liquid and frozen water, including rain and snow, that reaches the earth's surface.

3.6 Other control variables

Our analysis uses several district-level control variables: population, illiteracy rates, elderly dependency ratio, and average household sizes. These data were obtained from TurkStat (2024). Table 1 presents the descriptive statistics for all variables used in our study.

4 Theoretical framework

Questions about voting behavior and its determinants have intrigued scholars since Aristotle's time. The emergence of public choice theory in the 1950s brought renewed focus to these fundamental questions, particularly through new theoretical frameworks.

The economic model of voting behavior, pioneered by Downs (1957), applies rational choice principles to electoral participation. This model posits that voters, like economic actors, make decisions that maximize their utility. Individuals evaluate the costs and benefits when deciding whether to vote and which candidates to support (Kaniovski, 2019; Mueller, 2003).

The utility-maximization model of voting presents a paradox. Given that a single vote rarely determines an election's outcome, a rational cost–benefit analysis suggests that individuals should abstain from voting. The costs of voting—including time, effort, and information gathering—outweigh the negligible probability of influencing the result. Yet substantial voter turnout persists.

People's commitment to civic duty helps explain voter turnout. Voters derive satisfaction from the act of participation itself, beyond any potential influence on electoral outcomes (Kaniovski, 2019). This intrinsic motivation connects to feelings of patriotism and civic responsibility (Mueller, 2003).

Group identity and satisfaction from expressing political preferences also drive electoral participation (Kaniovski, 2019; Mueller, 2003; Munger, 2023). Voters value the opportunity to affirm their social affiliations and express their views through voting.

Voting decisions extend beyond individual self-interest to encompass broader social concerns. Voters consider collective welfare and societal outcomes when making electoral choices (Congleton, 2019; Kaniovski, 2019; Mueller, 2003). For instance, they evaluate general economic conditions alongside their personal financial circumstances (Kirchgässner, 2019).

Legal frameworks significantly influence voter turnout, particularly in nations with mandatory-voting laws. Where electoral participation is compulsory, citizens face potential penalties for abstaining, which effectively increases the cost of nonparticipation (Kaniovski, 2019).

The determinants of voter choice differ from those driving electoral participation. While the previously discussed factors explain why people vote, other variables influence how voters choose between candidates and between parties. For example, ideology serves as a cognitive shortcut in electoral decision-making. Rather than analyzing detailed policy positions, voters typically support candidates whose ideological stance aligns with their own (Downs, 1957). This pattern creates strong voting consistency, with research showing that 80% of voters maintain their party allegiance across elections (Paldam, 2008).

Voters evaluate incumbent governments based on their track record (Downs, 1957). Economic performance particularly influences voting behavior, with citizens holding governments accountable for economic conditions (Gomez & Wilson, 2006; Paldam, 2008; Rudolph, 2003; Stein, 1990).

External information sources shape voter preferences (Downs, 1957). Family environment, workplace interactions, traditional media outlets, and social media platforms all influence how voters choose between electoral alternatives (Leeson, 2008).

The discussion in this section helps us understand how natural disasters influence voting behavior. However, it does not yield conclusive predictions about the direction of the effects of the variables considered here.

Natural disasters can increase voting costs in multiple ways, including by leading citizens to focus on their own recovery and by damaging infrastructure and in turn impeding access to polling stations. These elevated costs typically reduce voter turnout (Sinclair et al., 2011). Governments can mitigate these effects through accommodative measures such as establishing temporary polling locations or allowing flexible voting arrangements (Stein, 2015).

Voter support for incumbent parties during disasters depends on several key factors, with government disaster response being paramount. Citizens evaluate both historical disaster management and post-disaster policies implemented before elections, potentially increasing their support for ruling parties when they view these actions favorably. This pattern aligns with retrospective voting behavior (Gasper & Reeves, 2011; Healy & Malhotra, 2009).

Ideological commitment and partisanship bias can diminish the electoral impact of disasters (Malhotra & Kuo, 2008). In regions where voters prioritize ideological alignment, natural disasters may exert minimal influence on voting patterns. This limited effect occurs when citizens either do not attribute disaster outcomes to government actions or lack confidence in opposition parties as viable alternatives, leading them to maintain their existing political preferences.

Media coverage following disasters can influence support for incumbent parties through increasing their visibility (Masiero & Santarossa, 2021). However, this effect diminishes in societies in which ruling parties already dominate traditional media outlets. In such contexts, government supporters regularly consume state-influenced media, while opposition voters typically rely on alternative information sources like social media. Consequently, disaster-related media coverage may fail to shift voter preferences when the media are heavily controlled.

Finally, disaster response and electoral behavior exhibit offsetting effects through several key mechanisms. Socioeconomic differences among voters drive different responses to disaster management (Reinhardt, 2015). Geographic variation in disaster impacts and relief distribution creates variation in voting behavior (Chen, 2013). Partisan bias shapes voters' interpretation of disaster-response efforts: Opposition supporters typically view relief as inadequate or politically motivated, whereas incumbent supporters see identical actions as evidence of effective governance (Malhotra & Kuo, 2008). These opposing forces can lead to null aggregate electoral effects.

5 Method

Earthquakes provide distinct analytical advantages compared to other natural disasters. Their occurrence along specific fault lines and their unpredictable timing make them random events. Importantly, earthquakes do not enter feedback loops and are not susceptible to simultaneity bias. While earthquakes can affect human decisions, human actions do not trigger earthquakes. This unidirectional relationship enhances the analytical value of earthquakes, offering a clear cause-and-effect framework for research.

Our district level data gives information about the five Turkish elections between 2014 to 2023, the last one occurring after the earthquake. This panel data set enables us to control for year fixed effects affecting all districts and district-level fixed effects. Including pre- and post-earthquake periods and earthquake-affected and unaffected regions enables comprehensive comparisons. We classify earthquake-affected regions as the treatment

group and unaffected areas as the control group, allowing us to analyze changes within and between these regions.

This study uses multiple approaches to define earthquake-affected areas, addressing an analytical challenge in natural disaster research. We employ alternative definitions, including those based on state-of-emergency declarations, MMI values, migration patterns, and building-collapse rates. The state-of-emergency regions include the 11 provinces declared disaster zones by the government immediately after the earthquake. For our MMI definition, we use MMI values from the US Geological Survey, aligning with the existing literature (Cerqua et al., 2023; Joseph, 2022). We classify regions with an MMI of 6 or higher as earthquake-affected (treatment) areas, while those below this threshold are designated as unaffected (control) areas. Figure 4 illustrates the distribution of districts according to this classification.

Our simple model can be written as follows:

$$y_{dt} = \gamma_d + \tau_t + \beta W_{dt} + \alpha X_{dt} + \varepsilon_{dt} \tag{1}$$

y_{dt} *is* the incumbent party's vote share or voter turnout in district d in year t, γ_d is a district fixed effect, and τ_t is a year fixed effect. Our coefficient of interest is β. W_{dt} is our difference-in-differences variable and equals 1 if the district was defined as an earthquake region in year t and after, and 0 otherwise. X_{dt} are other variables, and ε_{dt} *i*s the error term.

Initial examination of our data reveals two key challenges that inform our methodological approach. First, earthquake-affected regions show systematically different patterns of incumbent-party support compared to unaffected regions in pre-earthquake periods. Second, Turkiye exhibits substantial regional heterogeneity in terms of economic development, demographic composition, and political preferences, suggesting that not all unaffected regions would serve equally well as controls.Figure A2 provides evidence that the pretreatment parallel-trends assumption does not hold for the standard difference-in-differences approach. Specifically, the coefficients before the treatment are statistically different from zero, indicating diverging trends. This violation necessitates the use of alternative empirical approaches.

To address these challenges, we adopt the SDID approach developed by Arkhangelsky et al. (2021), which offers several key advantages. The method addresses potential violations of the parallel-trends assumption by reweighting control regions to create a more credible counterfactual that better matches the pretreatment trends of affected areas. This

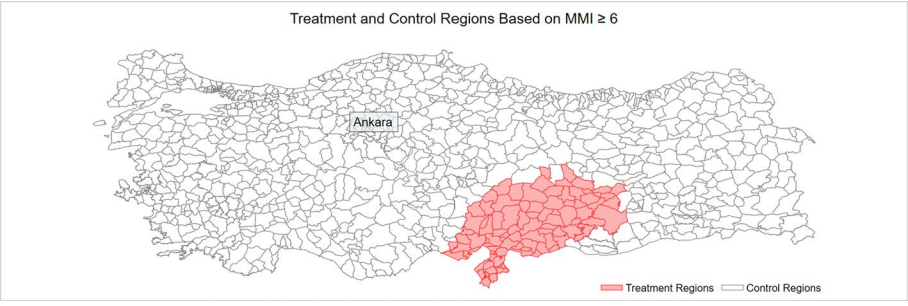


Fig. 4 Treatment and Control Regions Based on MMI ≥ 6 *Note* This figure shows the district-level treatment and control groups for the impact of the 2023 earthquake on electoral outcomes in Turkiye. Treatment groups are defined as districts where the Modified Mercalli Intensity Scale is greater than or equal to 6

is particularly important given the observed differences in pre-earthquake political patterns between affected and unaffected regions.

SDID is also well suited to handle Turkiye's substantial regional heterogeneity. The method optimally weights control regions based on their pre-earthquake similarity to affected areas, creating a synthetic control group that better represents what would have happened in earthquake regions absent the disaster. This approach improves upon the standard difference-in-differences method, which implicitly treats all control units equally regardless of their similarity to treated units.

Furthermore, SDID's time-weighting scheme addresses heterogeneous time trends across regions, combining the benefits of synthetic control methods with the advantages of difference-in-differences. By simultaneously accommodating nonparallel trends through unit weighting and removing time-invariant confounders through double differencing, SDID provides a more credible framework for estimating the earthquake's electoral impact than standard difference-in-differences approaches.

Finally, to validate our findings, we test multiple alternative specifications, detailed in Table A4 and Figure A2. The analyses include SDID estimations without control variables, standard two-way fixed effects models, and two-way fixed effects models with unit-specific time trends. All specifications yield consistent results, showing no significant earthquake impact on incumbent-party vote share or voter turnout.

6 Results

6.1 Main results

We define two earthquake regions for analysis. The first region (control) encompasses all districts within the 11 provinces where the government declared a state of emergency following the earthquake. The second region (treatment) consists of districts with an MMI of 6 or higher during the earthquake.

Table 2 shows our primary findings, with columns 1 and 2 illustrating the earthquake's effect on incumbent-party votes and columns 3 and 4 showing the impact on turnout rates. The effect on incumbent-party votes is virtually zero in magnitude and statistically nonsignificant. Similarly, voter turnout rates show minimal change. Although there is slight statistical significance for voter turnout, the coefficients remain close to zero.

Table 2 thus shows that despite the earthquake's massive toll, it had no impact on voter behavior. We explore this puzzle with additional calculations and analyses in the following sections.

6.2 Migration

While panel data sets and the SDID method in Sect. 6.1 mitigated many biases, that analytical approach may suffer limitations.

The earthquake displaced hundreds of thousands of people. Many relocated from the affected region (A) to the unaffected region (B). We designated region A as the treatment region and region B as the control region. However, region B was affected by the earthquake because of the resulting influx of displaced individuals. When assessing the impact of earthquakes or other natural disasters, it is crucial to address this issue, which we term *migration bias*.

Table 2 Impact of the 2023 Earthquake on Electoral Outcomes in Turkiye

Earthquake DID Variables	Incumbent Party's Vote Share		Voter Turnout	
	(1)	(2)	(3)	(4)
State of Emergency Regions x Post	−0.000		−0.010***	
	(0.005)		(0.003)	
MMI6 Regions x Post		0.003		−0.006
		(0.005)		(0.004)
Observation	5,820	5,820	5,820	5,820
Pre-treatment Treated Mean	0.601	0.647	0.831	0.833

This table shows the impact of the 2023 earthquake on electoral outcomes in Turkiye. Columns 1 and 2 are for the incumbent party's vote share, and columns 3 and 4 are for voter turnout. DID means difference-in-differences. We use two different definitions of earthquake regions. "State of emergency" is defined by the government comprising eleven different provinces. MMI6 is the one where the Modified Mercalli Intensity scale is higher than 6 in a given region. "Post" means after the earthquake. In all models, we used the synthetic difference-in-differences approach. In addition to the district and year fixed effects, all estimates include control variables: temperature, precipitation, population, illiteracy rate, elderly dependency ratio, and average household size. The "Pre-treatment treated mean" shows the average value of the outcome variable in the affected regions before the earthquake. Standard errors are bootstrapped. The significance levels are: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Using individual-level data instead of regional data offers a potential solution to account for human mobility following natural disasters. If post-disaster movements of individuals can be tracked, the treatment group can be defined at the individual level rather than the regional level. This approach allows for more precise identification of a disaster's effects.

Using individual-level data, while potentially addressing migration bias, presents significant challenges. Legal restrictions on personal data sharing limit access to those data. Furthermore, even when the data are accessible, using them in the analysis might not be technically feasible because we need nationwide data spanning pre- and post-disaster periods.

We address migration bias by focusing on individuals' birthplaces, as detailed in Sect. 3. Our primary assumption is that in the absence of an earthquake, the number of people born in an earthquake-affected area and residing in a given district would have followed similar trends to previous years. We calculate the change in the number of earthquake-region-born individuals in each district from pre-earthquake to post-earthquake years. Districts exhibiting a change in 2023 exceeding the mean of previous years plus two standard deviations are classified as treatment districts.

Figure 5 maps the treatment and control districts, incorporating both the in-migration districts and the earthquake districts (MMI ≥ 6). A comparison with Fig. 4, which only shows earthquake districts, demonstrates the effect of the change in the definitions of treatment and control groups.

Table 3 reports the earthquake's impact on election results after accounting for migration bias. Consistent with Table 2, Table 3 demonstrates that the earthquake does not affect voter behavior. That the null effect remains regardless of whether migration is considered validates the robustness of our initial findings.

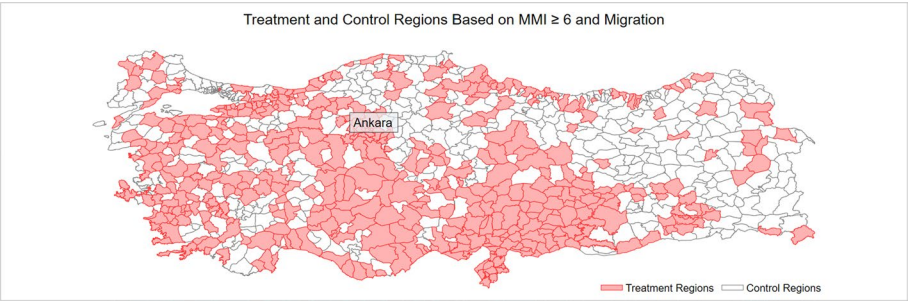


Fig. 5 Treatment and Control Regions Based on MMI ≥ 6 and Migration *Note* This figure shows the district-level treatment and control groups for the impact of the 2023 earthquake on electoral outcomes in Turkiye. Treatment groups are defined as districts where the Modified Mercalli Intensity Scale is greater than or equal to 6 and where the change in earthquake-born residents increased in 2023 by more than the mean plus two standard deviations of pre-2023 values in a given district

Table 3 Impact of the 2023 Earthquake on Electoral Outcomes Considering Migration

Earthquake DID Variable	Incumbent Party's Vote Share	Voter Turnout
	(1)	(2)
(MMI6 + Migrated Regions) x Post	−0.001	0.000
	(0.002)	(0.001)
Observation	5,820	5,820
Pre-treatment Treated Mean	0.604	0.850

This table shows the impact of the 2023 earthquake on electoral outcomes in Turkiye. Column 1 represents the incumbent party's vote share, and column 2 represents voter turnout. DID means difference-in-differences. We considered two earthquake-affected regions: 1) areas where the Modified Mercalli Intensity scale is higher than 6, and 2) districts where the change in earthquake-born residents increased in 2023 by more than the mean plus two standard deviations of pre-2023 values. "Post" means after the earthquake. In all models, we used the synthetic difference-in-differences approach. In addition to district and year fixed effects, all estimates include control variables: temperature, precipitation, population, illiteracy rate, elderly dependency ratio, and average household size. The "Pre-treatment treated mean" shows the average value of the outcome variable in the affected regions before the earthquake. Standard errors are bootstrapped. The significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

6.3 Building collapses

Earthquakes affect voter behavior primarily through the structural damage they cause. Unlike other natural disasters, earthquakes predominantly affect buildings. Following the 2023 earthquake, authorities assessed millions of buildings for damage. We used the resulting data set to create a building-collapse variable, aggregating data on collapsed, emergency-collapsed, and heavily damaged structures at the district level.

This building-collapse variable is helpful for two reasons. First, the variable quantifies the earthquake's severity and impact, enabling direct analysis of voter behavior in relation to disaster intensity. Second, residents whose buildings collapsed in this case are likely to have been more responsive to both implemented and promised government policies. This heightened sensitivity comes from the government's key post-earthquake initiative: providing new housing to victims who lost their homes (Anadolu Agency, 2023a, 2023b; Anadolu Agency, 2024a, 2024b).

Table 4 presents analyses using 2% and 5% thresholds for the ratio of collapsed buildings to population. Table A5 extends this analysis with 3% and 6% thresholds.

Table 4 presents a comparative analysis of earthquake-affected and -unaffected regions. Columns 1 and 3 contrast earthquake victims whose buildings collapsed with those whose structures remained intact. Columns 2 and 4 compare earthquake victims who experienced building collapse with residents of non-earthquake regions.

Panel A of Table 4 shows no effect of building collapse on incumbent-party votes. Panel B demonstrates a negative impact of 1%–2% of building collapse on election turnout rate. We find reduced voter turnout of earthquake victims whose buildings collapsed compared with those whose buildings did not collapse, no disparity is observed when comparing earthquake victims whose buildings collapsed to residents of non-earthquake regions.

Table 4 Impact of the 2023 Earthquake on Electoral Outcomes Considering Building Collapses

Earthquake DID Variables	Panel A. Incumbent Party's Vote Share			
	(1)	(2)	(3)	(4)
2% Building Collapses x Post	−0.003	−0.001		
	(0.006)	(0.005)		
5% Building Collapses x Post			−0.000	0.002
			(0.008)	(0.010)
Pre-treatment Treated Mean	0.617	0.617	0.631	0.631
Observation	2,664	3,528	2,664	3,378
	Panel B. Voter Turnout			
	(1)	(2)	(3)	(4)
2% Building Collapses x Post	−0.017***	−0.007*		
	(0.006)	(0.004)		
5% Building Collapses x Post			−0.021***	−0.010*
			(0.007)	(0.006)
Pre-treatment Treated Mean	0.830	0.830	0.835	0.835
Observation	2,664	3,528	2,664	3,378

This table shows the impact of the 2023 earthquake on electoral outcomes in Turkiye. Panel A is for the incumbent party's vote share, and Panel B is for voter turnout. DID means difference-in-differences. We create two different DID variables. One is if the share of Building Collapses by population is higher than 2%, and the other is higher than 5%. The columns of the table show the different specifications. Columns 1 and 3 compare the earthquake regions where the Building Collapses share is higher than 2% and 5% with the other earthquake regions. Columns 2 and 4 compare the earthquake regions where the Building Collapses share is higher than 2% and 5% with the other control regions. "Post" means after the earthquake. In all models, we used the synthetic difference-in-differences approach. In addition to the district and year fixed effects, all estimates include control variables: temperature, precipitation, population, illiteracy rate, elderly dependency ratio, and average household size. The "Pre-treatment treated mean" shows the average value of the outcome variable in the affected regions before the earthquake. Standard errors are bootstrapped. The significance levels are: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The analyses presented in Table 4 and Table A5 indicate that building collapses do not significantly affect voter behavior. Voters' support for the incumbent party and their participation in elections remain relatively constant, regardless of whether their buildings collapsed.

7 Mechanisms

7.1 Cost of Voting

Natural disasters can affect voter turnout through direct population loss. More than 50,000 people lost their lives in the 2023 earthquake. While data on the voting eligibility of the deceased are unavailable, estimates can be derived from population statistics. Turkiye's total population of 85 million includes 61 million registered voters, indicating that voters constitute approximately 70% of the population. Applying this ratio to the earthquake casualties suggests that roughly 38,000 voters died in the 2023 earthquake disaster.

While tragic, losing 38,000 voters has a limited impact on overall voter turnout rates. Within the declared earthquake emergency zone, which is home to more than 9 million registered voters, the mortality rate represents less than 0.4% of eligible voters. This relatively small percentage suggests that direct loss of life will have minimal effect on aggregate voter turnout.

Natural disasters also affect electoral participation through population displacement, both temporary and permanent. In the immediate aftermath of a disaster, residents rapidly evacuate the affected area. Some evacuees return to their original voting districts once they become habitable, allowing them to cast their ballots in their home regions.

Population displacement following natural disasters can become permanent, significantly affecting electoral participation. In Turkiye, earthquake survivors who permanently relocated outside the disaster zone had the opportunity to update their voter registration. The Supreme Board of Elections established a designated period between the earthquake and elections for address changes. This provision enabled displaced voters to cast ballots in their new locations by registering their settlements with public authorities.

Direct comparisons of voter turnout between earthquake-affected and -unaffected regions using the difference-in-differences methodology without accounting for migration patterns may yield biased estimates. Migration from disaster zones simultaneously reduces turnout in affected areas (treatment group) and increases participation in unaffected regions (control group). If this bidirectional population movement is not properly controlled for, the disaster's effect on voter turnout rates will be overestimated.

Official data show that 133,000 voters from Turkiye's emergency zone changed their registered addresses, representing approximately 1% of the zone's eligible voters. This migration-related decrease in voter numbers aligns with the turnout calculations presented in Table 2. However, when migration patterns are considered (Table 3), the apparent decline in voter turnout rates disappears.

The Supreme Board of Elections conducted comprehensive assessments of polling-station damage and took action to maintain voter access. Since some traditional voting locations, such as schools, sustained damage, the board established alternative polling stations in temporary settlements. Over 800 container units were designated as polling stations, with approximately half located in Hatay Province (YSK, 2024a, 2024b). National

media reports indicated that this number ultimately exceeded 1,000 units (Anadolu Agency, 2023a, 2023b). By installing polling stations in tent cities, election officials ensured voting access for displaced residents.

Election management bodies mitigated the earthquake's impact on voter participation through effective policy responses as confirmed by both national and international observers, including the Organization for Security and Co-operation in Europe (OSCE, 2023). The Supreme Board of Elections' adaptive measures—enabling voting in new settlements, facilitating temporary returns Table 4 for Election Day (Reuters, 2023a, 2023b), and establishing polling stations in temporary settlements—effectively countered the potential turnout reduction from mortality, migration, and infrastructure damage.

Regional analyses, however, show that earthquakes can affect voter turnout with substantial geographical variation. In severely affected areas like Hatay's Antakya district, turnout rates decreased by up to 14% compared to previous elections. However, the earthquake's overall effect on voter participation remained limited for two key reasons: the small proportion of heavily damaged districts within the total voting population, and the effectiveness of mitigation measures. Despite substantial variations at the local level, aggregate turnout rates remained stable.

7.2 Disaster Support

Natural disaster aid distribution significantly influences voter behavior through politically motivated allocation patterns. Research on pork barrel politics demonstrates that incumbent parties systematically direct more disaster aid to their constituencies, independent of actual disaster impact (Bechtel & Mannino, 2022). This preferential distribution incentivizes voters to support the incumbent party to secure new aid packages or maintain existing assistance.

The 2023 earthquake presents a unique case for examining disaster aid's impact on voting patterns. Unlike systems with multiple governing entities, Turkiye's centralized governance structure places disaster response solely under the incumbent party's control. While local elections might show partisan bias in municipal resource allocation, earthquake relief efforts operate differently. The central government administers aid across the entire affected region without partisan discrimination. Our analysis, which found no significant earthquake impact on voter behavior, focuses explicitly on state-provided disaster aid distributed during the three-month interval between the earthquake and the election.

The post-2023 earthquake disaster aid in Turkiye comprised three main kinds of assistance: establishment of temporary housing through tent and container cities, direct financial support, and residential reconstruction initiatives or commitments to rebuild destroyed structures.

The earthquake's sudden occurrence significantly constrained the potential for politically motivated aid distribution. Analysis of geographical aid-allocation patterns shows that emergency-response requirements, rather than regional political affiliations, dictated aid distribution. The imperative for rapid intervention superseded political considerations in both the establishment of tent cities and monetary aid disbursement. Unlike in typical pork barrel scenarios, the urgency of post-disaster needs precluded selective aid allocation based on voter preferences, necessitating swift and uniform emergency-response measures.

Potential political bias in aid distribution can be analyzed by comparing pre-earthquake voting patterns with subsequent aid allocation across affected regions. The provinces of Hatay and Kahramanmaraş, which suffered the highest casualties with 22,000 and 13,0

00 fatalities, respectively, illustrate this comparative approach. These provinces showed markedly different support for the incumbent party in the previous general election, with the incumbent party averaging 57% of votes in Hatay's districts and 67% in Kahramanmaraş's districts. This significant 10-percentage-point difference in political support within the earthquake zone provides a basis for examining potential disparities in aid distribution.

The distribution of container cities between Hatay and Kahramanmaraş demonstrates prioritization based on disaster impact rather than political allegiance. Despite its lower incumbent-party support, Hatay received 183 container cities while Kahramanmaraş received 55, collectively accounting for 60% of all container cities across the 11 provinces declared emergency zones (PSB, 2024). The allocation pattern correlates with earthquake severity, building-collapse rates, and displaced-population needs rather than pre-earthquake voting patterns for the incumbent party.

Direct financial assistance after the 2023 earthquake encompassed multiple aid categories distributed broadly. The comprehensive aid package included support payments for tent- and container-city residents, rental assistance for both homeowners and tenants, 10,000 Turkish lira in direct payments to 2 million recipients, 15,000 lira in relocation assistance to 50,000 households, and 10,000 lira in bereavement support to 40,000 families (PSB, 2024). The widespread distribution of this monetary aid, particularly the universal provision of direct payments to 2 million people and bereavement support to virtually all families who suffered losses, indicates the disbursement system was independent of political affiliations.

Post-earthquake housing reconstruction efforts also demonstrate distribution based on disaster impact rather than political allegiance. Of 100,000 completed housing units, Hatay and Kahramanmaraş each received approximately 20,000 (Anadolu Agency, 2024a, 2024b), despite their significant difference in incumbent-party support. The allocation plans of the Housing Development Administration of the Republic of Turkiye (TOKI) further reflect needs-based distribution: Adıyaman, with 70% incumbent-party support, had plans for 6,700 units, while Hatay, with 57% support, had plans for 75,000 units (TOKI, 2024). These allocation patterns clearly correlate with earthquake damage severity rather than political preferences.

Political patronage through public resource allocation occurs in Turkiye as elsewhere. However, the 2023 earthquake and subsequent election within three months created unique circumstances that altered traditional resource-distribution patterns. The disaster's magnitude and urgency compelled the incumbent party to deploy public resources rapidly for emergency response, superseding potential political calculations. The compressed timeline between the disaster and elections, combined with the imperative for swift, widespread aid distribution, minimized aid's effectiveness as a voter-persuasion tool. This constrained ability to leverage disaster relief for political advantage helps explain our finding of no significant electoral impact.

7.3 Political Polarization

Political polarization likely explains the earthquake's negligible impact on voter decisions. Research shows that party affiliation strongly influences how voters interpret events and information (Bartels, 2002; Heersink et al., 2022; Malhotra & Kuo, 2008). During natural disasters, voters' partisan alignment with the incumbent party shapes their assessment of the crisis. Party affiliation influences both voters' attribution of responsibility for the disaster and their evaluation of post-disaster policy effectiveness.

Two critical studies in Turkiye demonstrate how political polarization mediates earthquake impacts on voting behavior. Baysan (2022) compares voter responses between an experimental group subject to an information campaign and a control group. The findings show that neighborhood-level historical party preferences significantly influenced how voters processed new information. After exposure to the campaign, residents of pro-government neighborhoods showed increased support for the incumbent party. The same campaign decreased incumbent-party votes in historically low areas of incumbent-party support. This divergent response to identical information demonstrates how preexisting political affiliations intensify polarization rather than promote a uniform interpretation of the facts.

A public opinion survey conducted between the 2023 earthquake and the subsequent election shows stark partisan divisions in policy assessment (Balta & Ete, 2023). Among incumbent-party supporters, 90% approved of the government's earthquake response, while only 2% of opposition-party voters shared this view. Similarly, 93% of incumbent-party voters expressed confidence in the government's housing promises, compared to 8% of opposition supporters. These dramatic disparities in policy evaluation highlight how political polarization fundamentally shaped public perception of earthquake response measures.

The polarization in Turkiye extends beyond traditional partisan divisions to include religious identity, particularly the historical Sunni-Alevi divide. During the 2023 election, this religious element may have played a role, as incumbent President Erdoğan, representing the Sunni majority, faced opposition candidate Kılıçdaroğlu, of the Alevi minority. In earthquake-affected regions, some voters dissatisfied with the government's disaster response may have hesitated to support an Alevi candidate. This dynamic is similar to Leeson and Sobel (2011) analysis of Hurricane Katrina, in which identity-based preferences prevented voters from removing incumbents despite evident administrative failures. While we cannot directly measure its impact, religious identity may have influenced voters' decisions.

High political polarization and established voting patterns emerge as key mechanisms explaining the earthquake's null effect on electoral behavior in our study. Voters' preexisting party loyalties and religious identities superseded their assessment of disaster impact and disaster-response policies, demonstrating how political choices can prevent voter-discipline mechanisms from effectively responding to administrative performance during crises.

7.4 State vs. Social Media

Media exposure plays a crucial role in increasing incumbent-party votes following natural disasters. Masiero and Santarossa (2021) demonstrate that increased screen time for government officials and incumbent-party members contributed to their electoral gains after an earthquake in Italy. This heightened media presence allows incumbent-party representatives to showcase their disaster-response policies while increasing public visibility. Such increased media exposure typically translates into stronger electoral performance for the incumbent party in post-disaster elections.

Unlike the case studied by Masiero and Santarossa (2021), in our case the frequent media appearances of incumbent-party members following the earthquake might not yield positive electoral outcomes. This divergence stems primarily from fundamental differences between the Italian and Turkish media landscapes.

Turkiye ranks 158th among 180 countries in the Press Freedom Index, lagging 100 positions behind Italy (RSF, 2024). The country's media operates largely within a command-and-control system (Reuters, 2024). In such media environments, in which the state maintains ownership of outlets and infrastructure while enforcing strict regulations, Leeson (2008) demonstrates that citizens tend to become more politically ignorant and apathetic. This political disengagement is particularly concerning in Turkiye, where centralized control stems from media ownership concentration among government-affiliated conglomerates. While Turkiye has numerous national newspapers, five newspapers command approximately 50% of the total readership (Medyaradar, 2024). Further concentrating this control, four of these newspapers maintain pro-government stances, and three of the four are owned by a single holding company.

Media coverage of government officials before and after the earthquake was consistently extensive because of state control over news outlets, which diminished the media's effect on earthquake-related voting behavior. The preexisting dominance of the government in media coverage persisted through the post-disaster period.

Pro-government newspapers maintained their partisan stance following the earthquake. The Radio and Television Supreme Council penalized opposition channels with fines and broadcast suspensions, claiming they disseminated false information that undermined state authority and provoked public unrest. Additionally, authorities restricted internet access and blocked social media platforms in the days following the earthquake (NetBlocks, 2023).

Social media platforms serve as crucial alternative news sources in Turkiye. Over 65% of the population—57 million—actively use social media (DataReportal, 2024). Popular platforms such as X, Facebook, and Eksisozluk rank as Turkiye's 4th, 7th, and 18th most visited websites, respectively (Similarweb, 2024).

The government justified internet throttling and social media restrictions by citing the spread of alleged misinformation during the earthquake response. However, these restrictions backfired, as they led to wild speculation about the disaster's magnitude. While official reports in the initial days indicated 10,000 fatalities, the social media blackout fueled unverified claims suggesting the death toll could be as high as 200,000.

According to Yalçın (2023), both government and opposition media quickly resumed their partisan reporting patterns after the disaster. The political polarization intensified because of biased news reporting and public anxiety stemming from social media restrictions. In a media environment in which citizens exclusively consume news aligned with their political preferences and interpret information gaps through their preexisting ideological lens, the earthquake's potential political impact through media channels was effectively neutralized. This media ineffectiveness represents another reason for our null finding.

7.5 Offsetting

The geographic impacts of the earthquake likely produced offsetting effects on electoral outcomes. While the earthquake affected voting patterns, these effects counterbalanced each other, resulting in no detectable aggregate impact. This balanced outcome likely emerged from two distinct mechanisms operating simultaneously in affected regions. Our analysis focused on macro-level patterns and cannot preclude localized effects that may have shaped individual voting decisions.

Electoral responses within earthquake-affected zones varied based on preexisting political alignments. Voters experiencing similar earthquake impacts may have demonstrated divergent voting behaviors correlated with their prior political preferences (Baysan, 2022). Areas with strong government support tended to view disaster response favorably, strengthening their incumbent-party votes. Conversely, opposition-leaning regions interpreted the same emergency-management efforts negatively, reducing their support for the incumbent party. This partisan-filtered assessment of government performance likely produced counterbalancing effects, yielding no aggregate change in electoral outcomes. Such polarized responses align with broader patterns of partisan information processing observed in several countries.

Regional analysis shows parallel voting-pattern changes in earthquake-affected and control areas. Figure 6 illustrates the results of the SDID analysis that show shifts in incumbent-party support using the MMI ≥ 6 classification of earthquake regions. Both treatment and control regions exhibited similar decreases in incumbent-party votes following the earthquake, precluding a finding of earthquake-specific effects. While our study demonstrates local variations in electoral patterns, the absence of differential impacts from such a devastating earthquake—considering its significant death toll and economic damage—represents a notable finding. Despite varying exposure to the disaster, this uniform electoral response across regions highlights an unexpected aspect of voter behavior in Turkiye.

8 Conclusion

This study estimates the impact of the February 6, 2023, earthquake in Turkiye on voter behavior. The earthquake ranks among the most severe natural disasters in the world. In Turkiye, it resulted in 53,537 deaths and caused economic damages exceeding $100 billion.

We find no significant change in incumbent-party votes or voter turnout attributable to the earthquake. This null effect persists even when accounting for migration patterns

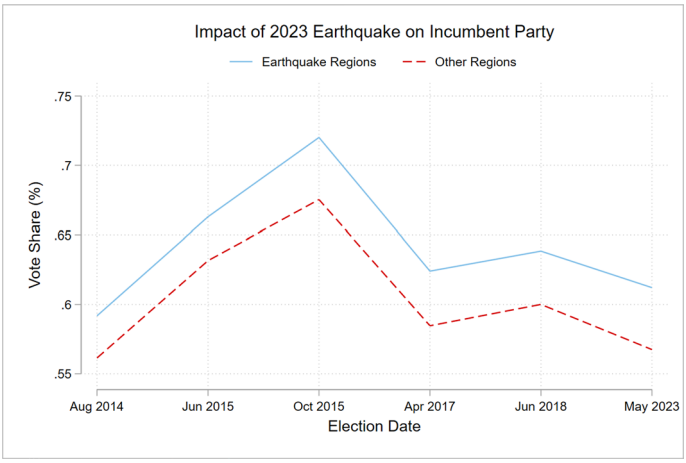


Fig. 6 Impact of the 2023 Earthquake on Incumbent Party Vote Share in Turkiye *Note* This figure shows the impact of the 2023 earthquake on incumbent party vote share in Turkiye, presenting graphical result from Column 2 of Table 2. The analysis uses the synthetic difference-in-differences approach. Earthquake regions are defined as areas where the Modified Mercalli Intensity Scale is greater than or equal to 6

and building collapses. Several key mechanisms explain this null effect. First, while the earthquake caused significant loss of life and displacement, its impact on aggregate voter turnout was mitigated through comprehensive electoral management policies, including establishing polling stations in temporary settlements and facilitating address changes for displaced voters.

Second, the compressed three-month timeline between the earthquake and elections created unique circumstances that altered traditional resource-distribution patterns. Unlike typical scenarios in which disaster aid might be leveraged for political advantage, the urgency necessitated rapid, widespread distribution based on need rather than political affiliation.

Third, intense political polarization played a crucial role in neutralizing potential electoral impacts. Survey data revealed stark partisan divisions in the assessment of earthquake response measures. This polarization led voters to interpret disaster response through their preexisting political lens.

Fourth, state-controlled media and social media created counterbalancing information flows. While traditional media maintained pro-government coverage, social media restrictions during the critical post-earthquake period led to increased speculation and mistrust among opposition groups.

Finally, our analysis shows significant offsetting effects that help explain the null findings at the aggregate level. While the earthquake may have affected voting patterns, these effects probably counterbalanced each other. Regions with strong government support viewed disaster response favorably, potentially strengthening their incumbent-party votes, while opposition-leaning regions interpreted the same emergency-management efforts negatively. Additionally, our SDID analysis showed similar decreases in incumbent-party votes in both treatment and control regions.

These findings show how institutional responses, political polarization, media dynamics, and offsetting effects can neutralize natural disasters' expected electoral impacts. While we focus on electoral outcomes rather than government performance—which Sobel and Leeson (2006) link to disaster-related bureaucratic inefficiencies and Leeson and Sobel (2008) to increased corruption in relief distribution—we find that even governance failures might not affect electoral outcomes. Future research could assess both the 2023 earthquake's long-term effects on Turkish political behavior, especially government delivery of promised reconstruction, and how these mechanisms function in less polarized settings.

Funding Open access funding provided by the Scientific and Technological Research Council of Türkiye (TÜBİTAK). This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declarations

Conflict of interest The authors declared that they have no conflict of interest.

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