Out of Sight, Out of Mind?
Electoral Responses to the Proximity of Health Care

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Abstract

Do voters reward incumbents for the provision of public services? In this paper, we study the political economy of catchment areas of public services to answer this question. Rather than examining the binary relationship between health care provision and electoral returns within politically defined borders, we study whether increases in geographic accessibility of health care providers and decreases in congestion in services attract votes for the incumbent. Leveraging a health care reform in Turkey, which substantially impacted the geospatial distribution of public health clinics in Istanbul, we find that decreases in walking time and improvements in congestion levels in the closest clinic from a polling station significantly increase vote share of the AKP, the incumbent party, at that polling station. We also show that poorer communities were more responsive to improvements in spatial accessibility to the local clinics.

Keywords: Elections, health care, geography, proximity, Turkey

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1 Introduction

A central normative claim in favor of competitive elections is that they drive the incumbents to maximize their odds of successful re-election through providing public services that improve the welfare of the citizens (Barro, 1973; Fearon, 1999; Ashworth, 2012). In theory, the democratic contract between politicians and voters is not complicated. Politicians must provide accessible and good quality public services to their constituencies, and in return, the voters who are the recipients of these services reward politicians at the ballot box. However, in practice, the relationship between the provision of services and electoral gains is not very clear. While some studies explore how service provision positively affects the incumbent's electoral performance (Harding, 2015), others have shown that it has no measurable impact (Imai, King and Velasco Rivera, 2020). Some others, perhaps surprisingly, have found that an increase in service provision leads to a decrease in a politicians' vote-share (Bursztyn, 2016; De Kadt and Lieberman, 2020).

Although different in geographical focus and substantive scope, previous studies investigating the relationship between the provision of public services and a politician's electoral performance have implicitly made the following assumptions. First, all residents within a politically defined geographical space (usually determined through availability of electoral and service provision data at the local levels), such as a village, district, or state, have equal access to the service provider. Second, there are no variations in the quality of the service providers within different geographic units.[1] A constituency would then be expected to reward the politician when it receives increased public spending or a new public service provider within its borders, such as a school, health clinic, or water well, independent of its location within the geographic unit and quality.

While this operationalization is theoretically simple and empirically practical, in practice, human geography does not always perfectly intersect with politically formulated areas. For example, the services situated within specific politically defined borders may not be geographically accessible to every resident. By the same token, a public service that "belongs" to another district could be greatly beneficial and accessible to those across the border. Similarly, an addition of a public service provider near a constituency can decrease the congestion levels of other service providers within that constituency's borders, which is another factor that significantly affects voters' access to public services. For example, waiting for four hours at a public health clinic due to congestion could drive a mother with a sick child to seek alternative service providers

[1] For two recent exceptions, both on the intermittency of services in the developing world, see Kumar et al. (2021) and Min (2019).

and perhaps private health care options. Consequently, the spatial attributes of public services and their interaction with the local population can affect whether voters deem a politician's performance successful or unsatisfactory based on the physical distance or the time that it takes to access a public service, independent of whether their locality received an increased number of service providers or a higher share of government spending (Rodden, 2010; Brinkerhoff, Wetterberg and Wibbels, 2018).

In this article, we contribute to the debate on whether citizens behave as agents for change or continuity by examining their response to changes in accessibility to free local health clinics and support for the political party in Istanbul, Turkey. However, in line with the above discussion, we have taken a spatial approach to measuring the changes in accessibility to services, namely the changes in walking time to the closest local health clinic from the polling station, as well as the changes in congestion levels of the closest health clinic. As is consistent with normative concepts of democratic accountability, we present evidence which suggests that there should be a strong positive relationship between the increase in citizens' access to health services and their satisfaction with a politician's performance. We also argue that this effect should be more pronounced for individuals who lack the financial resources to spend on transportation or private health care.

To test these hypotheses, we use the Family Medicine Reform in Turkey. Using the population-threshold rule, Family Medicine Reform assigned each citizen to a specific family physician in newly established Family Health Centers (FHC) that operate free of charge and on a walk-in basis. The design and implementation of the reform in Istanbul, which gave family physicians, not the local politicians, discretion to select the new clinics' location within a specific area, gave rise to a variation in voters' proximity to their local FHC. We use this variation and have assembled a set of data that combines electoral outcomes at the polling-station level with precise and localized information on changes in individual's proximity to local health care centers. This was done to investigate whether the changes in the distance to the clinics affected the support of voters in Istanbul for the Justice and Development Party (*Adalet ve Kalkınma Partisi*, AKP hereafter). We also investigated what type of voters react electorally to increased accessibility to services more than others.

Our findings support the hypothesis that voters reward politicians in power when their accessibility to government services, measured by walking time to the closest local health clinic and congestion at the closest local health clinic, increases. We found that a change in geographical proximity to the closest health clinic significantly impacted the votes that a politician received. For example, a 10-minute decrease in walking time from a polling station to the nearest clinic increased the vote share of the AKP in Istanbul, Turkey, by about 0.9 percentage points in that polling unit. We also found that poorer neighborhoods disproportionately

reward a politician with votes when the local health clinic is moved closer to them compared with those who are wealthier and less likely to use local health clinics. Finally, our results show that decreases in the doctor/population ratio, i.e., the congestion of local health clinics, significantly increases votes for the politician. Our findings are robust to including socio-economic and political controls.

These findings have important implications for understanding the link between public service provision and electoral support for a politician. First, in contrast to some previous studies, our results on electoral outcomes are consistent with the theoretical and normative ideals of democratic accountability. Also, our findings imply that the link between public service provision and electoral support can discipline governments even in settings where democracies are eroding, most likely because competitive (though unfair) elections remain intact in such mixed regimes (Stepan and Robertson, 2003, 2004; Levitsky and Way, 2010).

We also show the importance of examining the provision of health services in different spatial contexts. Previous research on electoral returns to health care provision has investigated changes in government expenditures aggregated at levels that do not always coincide with access to health care services. However, existing public health research has consistently documented that health care outcomes improve with decreases in congestion in health care clinics and increases in geographic proximity of individuals to health care providers. For instance, Wang et al. (2008) find that poorer spatial access to primary care physicians and mammography services creates a greater risk of late-stage diagnosis and mortality of breast cancer in Illinois. Gage and Guirlène Calixte (2006) show that geographic proximity to clinics significantly increases the likelihood of timely antenatal care and, consequently, improved mother-child health outcomes in Haiti. Moreover, Yu et al. (2020) demonstrate that congestion in hospitals in China causes a higher mortality rate. Thus, in line with existing public health scholarship, we focus on the *political economy of the catchment areas* of public health centers. Our results imply that voters do not cast their votes simply based on the existence, or the addition, of health care providers but instead they take into account how changes in the geospatial distribution of these facilities impact their experience with the public health system when evaluating whether they want to vote for a specific politician.

2 Theory

Adequate, equitable, and universal provision of public services by the government is widely viewed as necessary for good governance because it promotes economic development, economic growth, and citizen welfare.

A plethora of empirical evidence convincingly shows that governmental investments in and expansion of basic service provisions, such as primary education and health care, decrease child mortality, increase life expectancy, and improve educational attainment (Baum and Lake, 2003). Given its prevalence, the political determinants and consequences of public service provision are one of the most studied topics in social sciences.[2]

Previous studies of distributive politics have mainly focused on answering two separate but related questions. First, scholars have allocated much attention to establishing "who gets what" when politicians in power have substantial discretion over the allocation of public services in different institutional, social, and economic settings (Huber, Mustillo and Stephens, 2008). These studies have investigated whether governments target public services to urban communities (Majumdar, Mani and Mukand, 2004), their co-ethnics (Burgess et al., 2015), or core constituents (Cox and McCubbins, 1986; Dixit and Londregan, 1996) to maximize their re-election chances in upcoming elections. A considerable amount of scholarly work has also investigated whether the incidence and patterns of allocation are different among ethnically homogeneous and heterogeneous settings (Alesina, Baqir and Easterly, 1999; Baldwin and Huber, 2010; Kustov and Pardelli, 2018), as well as democracies and non-democracies (Stasavage, 2005).

The second line of research has sought to assess the electoral returns gained from the provision of local public goods and services. Surprisingly, except for a few recent contributions, there has been little quantitative analysis of whether—or under what conditions—voters electorally reward politicians in power for delivering on local services, providing conflicting evidence for the extent to which democratic accountability works in developing countries (Harding, 2015; De Kadt and Lieberman, 2020; Bursztyn, 2016; Imai, King and Velasco Rivera, 2020).

In this paper, we take up this question by incorporating the spatial nature of public services into the analysis. Geographic factors play a significant role in access to and the use of government-provided services, especially health care facilities. Public health literature has consistently established the importance of the existence of local primary care clinics and hospitals within walking distance from communities on good health outcomes. O'Meara et al. (2009) show, for example, the incidence of hospitalized malaria doubles as travel time to the nearest primary care facility increases from 10 minutes to 2 hours in Kenya. Similarly, Gage and Guirlène Calixte (2006) show that the availability of health centers within 5 kilometers significantly

[2]For a comprehensive review of political determinants and the consequences of distributive policies, see Golden and Min (2013)

increases the odds of initiation of antenatal care in Haiti. In fact, most existing work in public health literature has examined minimal areas around clinics and hospitals to measure and assess access to health care. For example, McLafferty and Grady (2004) define "convenient access" to health clinics as 2 miles in Brooklyn. Similarly, Yang, Goerge and Mullner (2006) define easy access as 1 mile around the patient residence or 30-minute car travel time in Illinois. The evidence, therefore, is consistent and clear across developed and developing countries that public health scholars define catchment areas of public health facilities as very small geographic units that do not perfectly align with political and administrative zones.

While public health literature shows that geographic access to clinics and hospitals matters for health outcomes and political accountability theories suggest that better health outcomes should attract more votes for the incumbent, the connection between geographic access to health care facilities and the incumbent's electoral performance remains understudied in political science literature (Brinkerhoff, Wetterberg and Wibbels, 2018; Ichino, Williams and Wibbels, 2018; Tajima, Samphantharak and Ostwald, 2018). In most cases, what is defined as "convenient access areas" around health care facilities by health scholars do not perfectly intersect with political units used to aggregate votes in elections by politicians and political scientists. Given the lack of emphasis on the political economy of geographic catchment areas, most previous work that focuses on the electoral returns from the provision of public services has employed a somewhat limited definition of "access". Existing studies usually implicitly define and operationalize *accessibility* (for services that needs commuting) as a dichotomous variable where an individual or an electoral precinct has either full access or no access at all, i.e., $a \in \{0, 1\}$, depending on the political and formal boundaries of the locality of the service provider. Consequently, most studies measure the change in the accessibility of a service using an appropriate sub-national unit —states, cities, counties, villages— to compare the electoral responses of voters whose localities received governmental services with those whose localities did not.

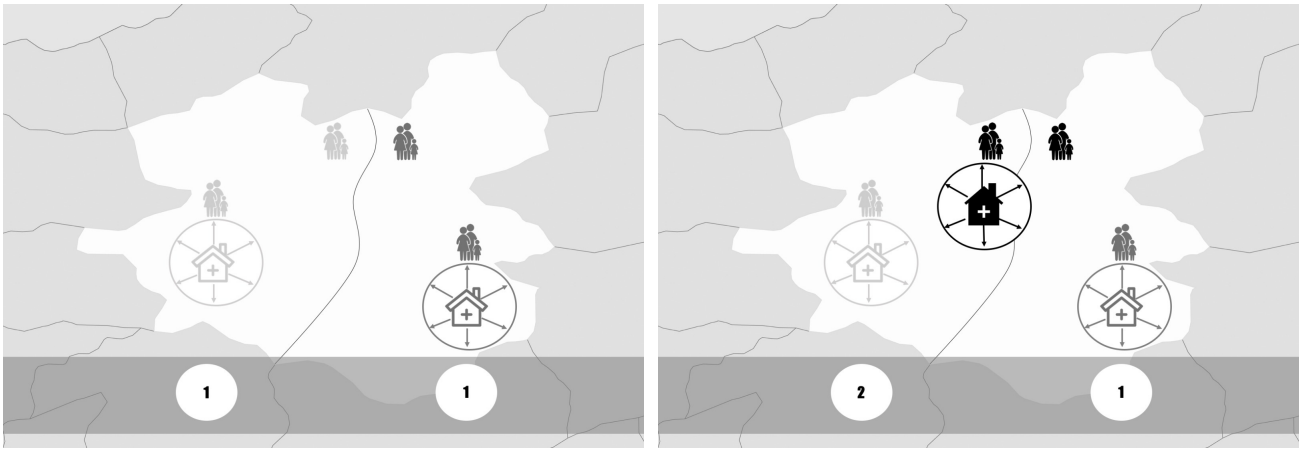
However, both theoretically and practically, it is not clear why voters should reward services provided in their politically defined sub-national unit if access to these goods is prohibitively costly or exhausting because of geographic distance. Sub-national borders used to collect data and regulate governmental activities are often not meaningful for individuals' everyday experiences. Why would voters reward an incumbent, for example, for building a hospital that is 20 miles away, and hence well beyond the distance limit most public health specialists would define as "at an accessible distance", although it is within the borders of their administrative unit? Similarly, what happens when a public health clinic is built near a community that falls out of their locality's formal border but is used by the residents every day due to their geographic proxim-

ity? Moreover, aggregating electoral results and public service provision at arbitrary units introduces the modifiable areal unit problem, which causes different geographic aggregations of the same data to generate different outcomes (Lee and Rogers, 2019). These concerns raise questions about the precise connection between the way previous studies have defined *accessibility* to public services and electoral responses.

To better understand the degree to which voters are responsive to changes in access to public services, we introduce a novel way of defining and operationalizing accessibility. In this paper, we relax the implicit assumption that everybody within a district has perfect accessibility, i.e., $a = 1$, independent of the distance between them and the public service. We argue, instead, that *accessibility* is a continuous measure between 0 and 1, $a \in [0,1]$, where the outcome is a decreasing function of the distance - or travel time- (d) between the community and the public service, i.e., $a = f(d) \in [0,1]$. In practice, a family that lives across the street from a new clinic will have a much easier time accessing the free public clinic than another family that lives 50 miles away. Of course, these families will have a different evaluation of the government's performance on the distribution of health care facilities.

Figure 1 demonstrates how changes in proximity to a public service –in this case, health care clinics– and changes in the number of service providers within a district operate distinctly. Figure 1(a) shows an initial distribution of voters and health care clinics. The geographically closest households and health clinics are marked with the same color. Figure 1(b) demonstrates the changes both in the total number of health care providers within two districts, as well as how voters' geographic distance to the closest provider changes with the new investment. Although the district on the left, within its formally drawn borders, received a new health care clinic, Figure 1(b) emphasizes that voters from both sides of the district border could benefit from the new public investment, and consequently, cast their votes for the incumbent in the next elections. When the catchment areas of public services are not taken into account, comparing the changes in the votes for the incumbent from the two districts could signal that voters do not electorally respond to increases in investment in services, when, in reality, it might be the case that communities from both districts electorally reward the incumbents because the new service provider has been placed near voters from both districts.

Furthermore, we assert that changes in accessibility, as a function of geographical proximity, will be more critical for some types of voters than others in evaluating how the government has performed when they are making electoral decisions. Some people will disproportionately appreciate proximity and ease of access. Income or wealth, for example, determines both the reliance on governmental provision of free and universal services and resources that could be spent to commute to the provider. A household with better



(a) Time= t: distribution of clinics and communities. (b) Time= t+1: distribution of clinics and communities.

Figure 1: Catchment areas vs. formal borders. Colors show the closest clinics to communities.

financial means can use a private provider in the absence of a readily accessible public health care facility (or any other public good). Also, for these types of households, the cost—both in financial and temporal terms—of accessing the provider will be relatively lower compared to those with modest means. A family that owns a car, or could afford taking a taxi, can easily travel to a clinic that is 30 miles away. In contrast, for a family without a car or financial means to hire transportation services, this might prove prohibitively costly, challenging, and time-consuming.

Finally, we assert that a spatial investigation of public services and electoral returns allows us to examine how new service providers close to a constituency increase the incumbent's votes, even if that constituency is not a direct beneficiary of the new public service provision. We contend that the provision of new health care facilities affects the changes in the congestion levels of the existing providers, which will impact the voters' assessment of politicians in office, as service availability and accessibility fall with increasing congestion levels. For example, a newly built health care clinic not only pleases the population within its geographic catchment area but also generates positive externalities on the population in the close distance (but not in the new clinic's immediate catchment area) by decreasing their health care facility's congestion levels. Put differently, the new health clinic in Figure 1(b) not only improves the government's performance perceptions of households shown in black, because a public health service provider moves closer to their residences, but also improves the incumbent's performance assessment for those households shown in gray, because the new facility decreases congestion levels in their clinic.

In summary, our empirical expectation is that increases in the geographical proximity of a community to

public health facility should improve the electoral performance of the incumbent. For example, in Istanbul, we expect citizens to reward the incumbent, AKP, when a local health clinic moves closer to them. Moreover, we argue that this effect will be more pronounced in polling stations situated in neighborhoods with more modest means. Finally, we expect the local population to reward the incumbent when the congestion at the closest health care clinic falls.

3 Institutional Background

In Turkey, the first steps to systematically provide universal preventative health care were taken in 1961 with the introduction of the Law on the Socialization of Health (Law No. 224, 1961). This law required the establishment of local health centers (*Sağlık Ocağı*) to serve approximately 5,000 to 10,000 people in their geographic catchment area, guaranteeing that every district *(ilce)* has at least one local clinic with a doctor. Following the legislation, the government made a great effort to build local health centers across the country. Acting as the first point of contact between the patients and the health care institutions in the system, these clinics offered primary care services, information on public health, and family planning. By 1983, despite the financial difficulties and lack of human resources prevalent, all cities had local health centers offering free preventative and curative care, along with guidance on family planning (Tatar et al., 2011; Atun et al., 2013).

Although these reforms were implemented to provide an equal and universal access to primary health care services throughout the country, in the long run, the clinics became overburdened by the workload and insufficient geographic coverage. The main reason behind the inefficiency of the system was that these local health care centers were responsible for a geographical area rather than a predetermined number of citizens. As the population in big cities increased over time by migration, population growth, and new construction of residential complexes, these clinics became over-crowded. By 2009, the average number of people per local health clinic was 11,433 countrywide. However, some places were experiencing more problems than others. In Istanbul, for example, the average number of people per health clinic was 25,807. These numbers meant that, on average, each doctor that worked in a local health clinic in Istanbul was responsible for 7,133 people (Istanbul Kalkinma Ajansı, 2010). Of course, this number was much higher in more crowded districts.[3] Patients in communities with a high patient-clinic ratio usually preferred going

[3]For example, in Adalar, a district with low population that was not impacted by the construction boom in Istanbul due to its

to public hospitals, or to private health care providers, to seek primary and preventive health care. This substitution effect overburdened the public hospitals and generated congestion (Baris, Mollahaliloglu and Aydin, 2011; OECD-World Bank, 2008; Tatar et al., 2011).

The AKP has dominated Turkey's political arena since its first debut at the 2002 parliamentary elections, winning an absolute majority of the seats in the parliament. It has gradually built power, winning pluralities in all legislative elections since 2002. In 2005, the AKP implemented a large-scale nationwide health care reform of the primary health care system, known as the Family Medicine Program (FMP). Health care reform was placed on the government's agenda partly to accelerate the harmonization process with the European Union. However, the main goal of the AKP government was to attain wide-spread electoral support for transforming the laggard health care system to keep its promise of improvements in socioeconomic welfare (Agartan, 2015).

The FMP assigned each citizen, regardless of income, occupation, ethnic background, or party affiliation, to a specific doctor. Family physicians, who are public employees recruited from the existing pool of general practitioners, were ordered to work at the Family Health Centers (*Aile Sağlığı Merkezi*) that operate on a walk-in basis and are located within neighborhoods near where the patients live. Similar to the local health clinics that existed before the reform, health services offered at the Family Health Centers (FHC) were intended to be free of charge. The primary responsibility of the FHCs was to provide a wide range of primary care services with an emphasis on the prevention of chronic diseases. FHCs were also responsible for vaccination, antenatal care, infant follow-up, and family planning. After its successful implementation in pilot cities, the reform was gradually extended to the whole country. Istanbul, the largest city in Turkey with almost 16 million inhabitants, joined the FMP in November 2010.

There were two critical differences between the old *(Sağlık Ocağı)* and new clinics *(Aile Sağlık Merkezi)* induced by the reform. First, the pre-reform local health care centers operated with geographic catchment areas, whereas the new FHCs were assigned a population group within their geographic catchment areas. The Ministry of Health aimed to assign at most 3,500 citizens per doctor. Thus, the reform ensured equality in access and quality of service among clinics. While every person was assigned to a doctor, the reform also guaranteed that each clinic, on average, had the same workload. Qualitative evidence confirms that the

historical and natural character, there were only 3,585 people within a local health clinic's geographic catchment area. In contrast, in the Umraniye district, which was significantly impacted by the construction of high-rise residential apartment complexes, this number was 38,218.

reform has effectively reduced waiting times at public hospitals and improved access to primary health care (Akdag, 2009; OECD-World Bank, 2008). Tatar et al. (2011) show that patient satisfaction has also increased substantially between 2003 and 2010. The reform also had a significant impact on immunization coverage rates and infant mortality (World Bank, 2013; Cesur et al., 2017). Second, the bylaw on the FMP stipulated the rules concerning the physical qualities of the buildings in which FHCs can operate, along with a detailed list of the required medical devices, aiming to provide an equal health care opportunity for every individual.[4]

Before the reform went into effect, the Istanbul Directorate of Health obtained population data from the Turkish Statistical Institute and established doctor geographic catchment areas consisting of 3,500 individuals, independent of the existing local clinic network or infrastructure to ensure the population threshold was met. The Directorate of Health then tried to match a majority of the buildings of the existing pre-reform local health clinics to establish FHCs to minimize the costs of the reform. In March 2010, it assigned coordinators to each district in Istanbul. Between March and April 2010, the coordinators visited existing local health clinics within their jurisdiction and reported the suitability of these buildings for transformation to the FHCs. Some buildings were permitted to be used as FHCs straight away, whereas some others needed renovations before the transformation to comply with the code. The rest of the existing buildings were found unsuitable for the operations of the FHCs and subsequently converted into government offices with other functions.

Coupled with the closure of the local health centers deemed unsuitable for transformation to the FHCs, many new clinic buildings were needed to bring the population-doctor ratio to the limits determined by the law. However, there were severe difficulties in finding available areas to build new clinics. For one thing, Istanbul is a very old city with a high population density, high building coverage ratio, substandard construction, and inadequate infrastructure. Especially within the city center, there were not enough empty lots to build new clinics. In most instances, the building sites for the new FHCs were dictated by the available land, such as green areas or children's parks.[5]

[4]For example, according to this bylaw, the clinics should be at least 60 meter-squares big, with an additional 20 meter-squares for each additional doctor. They should be situated either in stand-alone buildings or in the first floors of buildings shared with other establishments. For a full list of the requirements, see `https://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.17051&MevzuatIliski=0&sourceXmlSearch`

[5]In Appendix, we show evidence that the new FHCs built by the government were built on the only available green spaces or empty plots within Istanbul, using satellite pictures. See Figure A.3 and Figure A.4 in Appendix for an example of a clinic which was built on the only feasible plot in the neighborhood.

For another, the time allocated for the transformation was very short. Istanbul Directorate of Health merely had six months -between April 2010 and October 2010- to come up with a strategy to accommodate doctors in more than 300 new clinics. In some cases, the local municipalities or philanthropists tried to help by building clinics on their property and transferred them to the Directorate of Health, which then appointed doctors. Despite the efforts of the Directorate and the municipalities, only a handful of clinics were built in time by the government to match the need created by the reform.

The Directorate of Health tried to come up with an alternative solution specific to Istanbul to solve the shortage of clinics with adequate space and facilities, called "virtual FHCs" (*Sanal Aile Sağlığı Merkezi*). The Directorate requested doctors appointed to work in FHCs with no designated clinics to rent office spaces within their catchment area. After finding an office space that complied with the FHC code, and subsequently getting the approval of the Health Directorate, the doctors also were to provide the necessary furnishing and medical device requirements. In a way, the government delegated its responsibility for building new clinics to the doctors.

The decision about where to locate the clinics within their catchment area was entirely up to the doctors, primarily influenced by what was available on the market.[6] However, finding clinic spaces turned out to be a difficult task. In addition to the physical and technological conditions listed on the bylaw, the clinics could only be located on the lower floor of the buildings. Also, the clinics had to have a private entrance from the street. Finally, the other tenants living in the building needed to agree that a clinic could be opened. Given the short time frame and the strict set of physical conditions, the market availability of suitable apartment buildings had the ultimate effect on the geographic distribution of the FHCs.

Before the reform, the total number of local clinics in Istanbul was 604, with 2,100 general practitioners. The FMP went into effect on the 1st of November, 2010. At the end of the year, the transformation of all the existing local clinics was complete, and 762 new FHCs were in operation. The number of the FHCs increased further and reached to 891 with a total of 3,540 doctors just before the 2011 general elections in June. In the end, 321 new clinics were as "virtual FHCs", i.e., almost all of the new clinics that were not conversions from the old clinics (*Sağlık Ocağı*) were established by doctors by renting apartments through market operations.[7]

The FMP provides us the unique opportunity to test our hypotheses. One potential concern for assessing

[6]Official Gazzette No: 28539, 25 January 2013.

[7]`http://www.istanbulsaglik.gov.tr/ahweb/ist_ah.aspx`

the impact of public service provision on electoral outcomes is that these goods can be strategically targeted by the politicians for political purposes. However, as already indicated, the population threshold was the main criterion for the allocation of the FHCs, which alleviates the concerns for strategic targeting of these new clinics. Also, the geographical distribution of most of the clinics were determined by the doctors –not a government regulated agency–, subject to a very constrained housing market in Istanbul. Given that every citizen got assigned to a doctor, we exploit small scale changes in geographical differences in access to local clinics in Istanbul. We also investigate the possibility of targeting in Section A of the Appendix.[8] We find no evidence that the AKP government clientelistically distributed health clinics.

4 Data and Variables

To test our theoretical predictions, we combine data from several sources. First, we obtain data on pre-reform primary health care clinics from the Istanbul Health Directorate. We scrape data on post-reform local clinics and other health care providers from a website that includes detailed information on a variety of health care institutions in Turkey.[9] Using data from these two sources, we construct a panel data set that includes all primary health care clinics in operation between 2009-2011, as well as the number of physicians at each clinic over time. We geo-code all clinics to calculate the relevant geographic variables.

We get electoral data on polling station level from Turkey's Supreme Election Council for two different elections held in 2009 and 2011. We use three measures of support for the incumbent: AKP's vote share, AKP's vote margin, and voter turnout. 2009 is a local election, while 2011 is a parliamentary election. Scholars of Turkish politics broadly agree that the voters cast their votes overwhelmingly based on party identification, ideological positions, and economic (dis)satisfaction independent of whether it is a national or a local election (Kalaycıoğlu, 2014). This is not surprising, given that the powerful centralist administrative system in Turkey: local administrations have minimal policy responsibility beyond basic services such as water provision and domestic waste services (Incioglu, 2002). Hence improvements in health care would likely be attributed by the citizens to the central government headed by the AKP. In local elections, citizens cast votes for the mayor and the members of the municipal and provincial councils. Scholars of Turkish politics consistently agree that the provincial general council (*İl Genel Meclisi*) vote shares in local

[8] See Table A.1-A.4 for a series of analyses that investigate political targeting.

[9] `https://halksagligimerkezi.com/kuruluslar/aile-sagligi-merkezi/istanbul/`

elections "give the best approximation to the results of a general election compared to other levels of local elections"(Çarkoğlu, 2009, pg.1) due to various factors. First, village residents, who do not cast votes for the mayor and the municipal council, cast votes for the provincial general council. Second, provincial general council votes are not impacted by the personal charisma or popularity of the mayoral candidates (Akarca and Tansel, 2006). Thus, we use both the municipal council and provincial council vote shares in the 2009 local elections in our analyses.[10]

We test our theoretical predictions using election results at the level of polling stations *(sandık alanı)*, the smallest unit at which election returns are aggregated. Most polling stations in Istanbul are the local schools. The assignment of voters to polling stations depends on the proximity of their registered residence to that polling station, with voters residing close to each other being more likely to vote in the same building.[11] To compute the changes in walking times between voters and the closest clinic, $\Delta Walking\ time$, we match every polling station to the nearest primary health care clinic for each election.[12] We calculated the as-crow-flies distance between each polling center and clinic using the "great circle distance" measure, and picked the pair with the shortest distance.[13] Then, using Google Maps, we compute the walking time between these two locations.[14]

[10]Electoral rules differ for local and national elections. The sub-national unit in Turkey is the municipality *(belediye)*, for which a mayor is elected every five years through a first-past-the-post system. Municipal and provincial councils are also elected in local elections with respect to different electoral rules. In this paper, we use vote shares of mayors, municipal council and provincial council. Parliamentary elections, on the other hand, are held within a closed-list, proportional-representation electoral system, where votes are translated into seats following the d'Hondt formula. Importantly, the party lists for the local and parliamentary elections are very similar.

[11]Although the Supreme Election Council does not disseminate official data on the polling station catchment areas, our informal correspondences with the Supreme Election Council of Turkey confirm that polling stations are placed within neighborhoods to ensure that most voters can vote at a school building closest to their residences. The official description can be seen here: `https://www.anayasa.gen.tr/298sk.htm`

[12]A similar strategy has been used by Cantú (2019*b*) to evaluate the effects of vote buying strategies on electoral results in the context of Mexican presidential elections.

[13]Greatest circle distance or orthodromic distance computes the shortest distance between two points on a spherical surface, and is a commonly used measure by Geographic Information Systems analysis.

[14]We use Google Maps Distance Matrix API through googlemaps library in Python. Another strategy would be to calculate the changes in driving time from each polling station to the closest FHC, however, we cannot calculate driving times retrospectively

For each election between 2009 and 2011, Istanbul had more than 1650 polling centers, which means each neighborhood had, on average, more than two polling stations. Given that most urban neighborhoods' areas range between 0.05-2 square kilometers, it is clear that most polling stations are very close to voters' residences, usually within a few minutes of walking distance. However, if polling stations are not equidistant to all voters around its catchment area, i.e., if polling stations are not centrally located, then our walking time variable could still have measurement error. To overcome this problem, we created an alternative variable, $\Delta Walking\ time\ (centroid)$, that measures the changes in walking time to the nearest FHC from a precinct. The Supreme Election Council of Turkey does not disseminate information on the exact borders of polling stations' catchment areas. However, qualitative evidence shows that voters are typically assigned to the polling stations closest to their residences. Thus, we created Thiessen polygons around each polling station which is the best approximation to actual catchment areas.[15] Then, using the same strategy, we measure the distance from the centroid of the Thiessen polygons, i.e., the catchment areas of the polling stations, to the nearest FHC.[16] [17]

We supplement this data with demographic and neighborhood-level socioeconomic characteristics obtained from the Turkish Statistical Institute. The polling stations are nested within the neighborhoods, *mahalle*, geographically small units with an average population of 24,000. Neighborhoods are the smallest administrative levels for which socio-economic data is available from the Turkish Statistical Institute, nested within districts (*ilce*) that make up a city. We assume that the demographic characteristics for each polling station are captured by the administrative data from the neighborhood in which each polling station falls since voters vote at the polling station nearest to their residence. We obtain data on population, the share of university graduates, old and young dependency ratios.[18]

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using Google maps given the improvements in road networks that took place between 2009-2020 that could bias the results.

[15]Thiessen polygons are generated from a set of sample points such that each polygon defines an area of influence around its sample point so that any location inside the polygon is closer to that point than any of the other sample points.

[16]A more micro approach would be to measure the decreases in distances to an individual's residence and investigate its effects on vote choice using survey data. However, that approach would entail studying "intention to vote" rather than actual electoral outcomes. Yet, especially in electoral contexts like Turkey, self-reported vote intention may not correctly reflect behavior due to social desirability bias and fear of governmental retribution (Gonzalez-Ocantos et al., 2012; Albertus, 2019).

[17]See Figure A.5 and Figure A.6 in the Appendix for the centroids of the catchment areas as well as the actual locations of the polling stations for Istanbul and Besiktas district, respectively.

[18]Most work that studies elections in developing countries that work with very granular geographic data usually use controls at

Moreover, we obtain data from the Istanbul Health Directorate on whether a neighborhood has a public hospital and the number of private health care facilities in neighborhoods. We complement health care services data with an original data set scraped from the internet on the average market value of one square meter of housing for each neighborhood, annually calculated by Istanbul's governorship and published by the district municipalities,[19] to control for residents' wealth. Figure 2 visualizes our data for *Umraniye* (one of the 39 districts in Istanbul that received a lot of new FHCs due to the low pre-reform doctor to resident ratio), showing the pre-reform and post-reform polling stations and health clinics.

Sample Restrictions

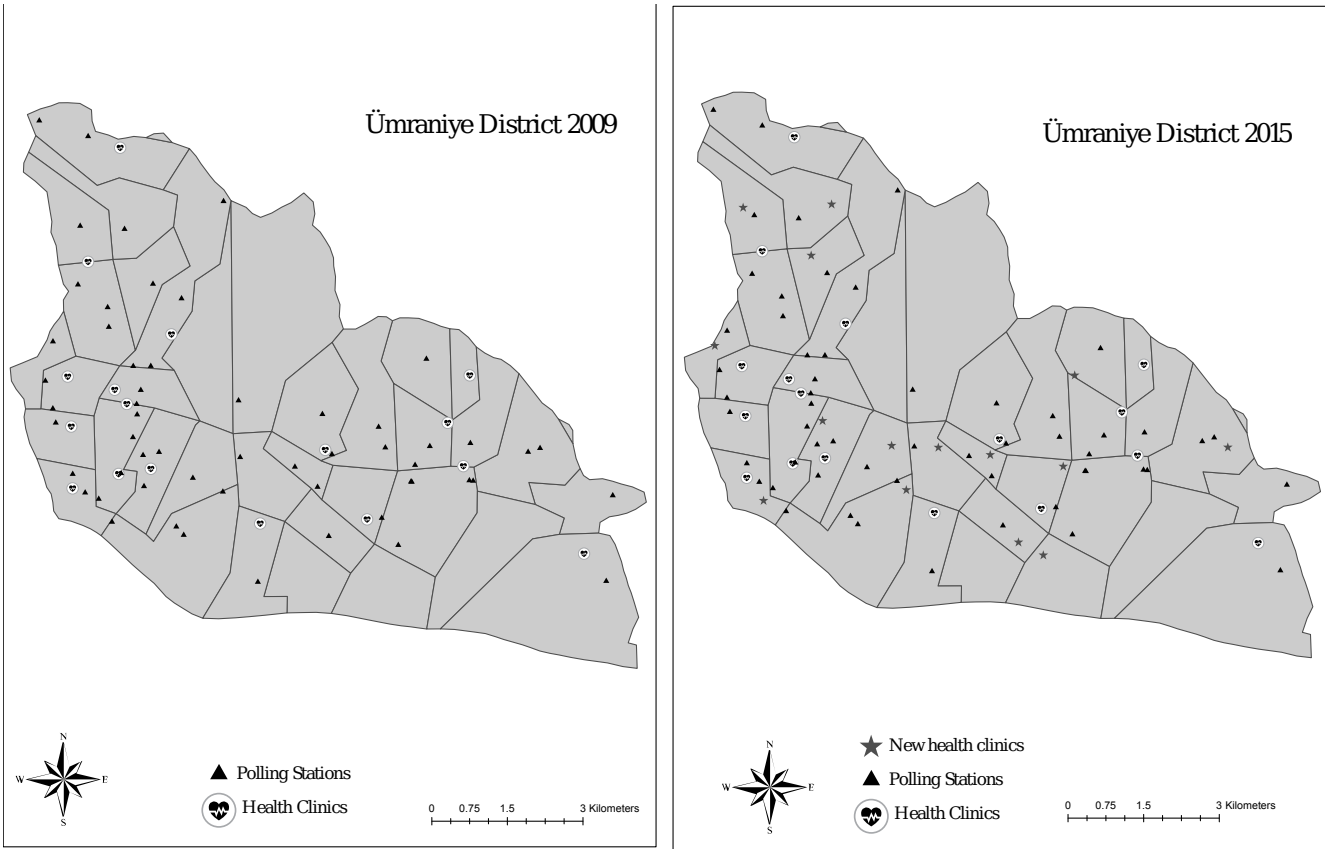
We impose several conditions on our sample. First, we drop the observations for neighborhoods on the Prince Islands *(Adalar)*. Second, we drop observations within the top and bottom percentile of changes in walking time.[20] Third, we exclude polling stations that were set up in prisons. Thus, our final sample consists of 1,468 polling stations, out of which 1,288 experienced a change in proximity to health care between 2009 and 2011.[21] Figure 3 shows the density distribution of polling units with respect to distance

higher levels of aggregation (usually district level controls for polling-station level analyses) due to data collection and dissemination practices of governments. For notable examples, see Ichino and Nathan (2013); Ascencio and Rueda (2019); Larreguy, Marshall and Querubin (2016); Cantú (2019*a*). Additional robustness checks demostrating the homogeneity of neighborhoods are available upon request.

[19]We used information from the government's website: `https://www.turkiye.gov.tr/belediye-listesi`. This data is at the street level (*sokak seviyesi*), and we used the median street value within a neighborhood (*mahalle seviyesi*). To further demonstrate that the assessed values are a good indicator of actual house prices, we scraped one of the major real estate websites in Turkey, `www.emlakjet.com` and compared average house prices on the market with our municipality-assessed values. The results show that the correlation between per meter squared property evaluations and house prices at the district level is high.

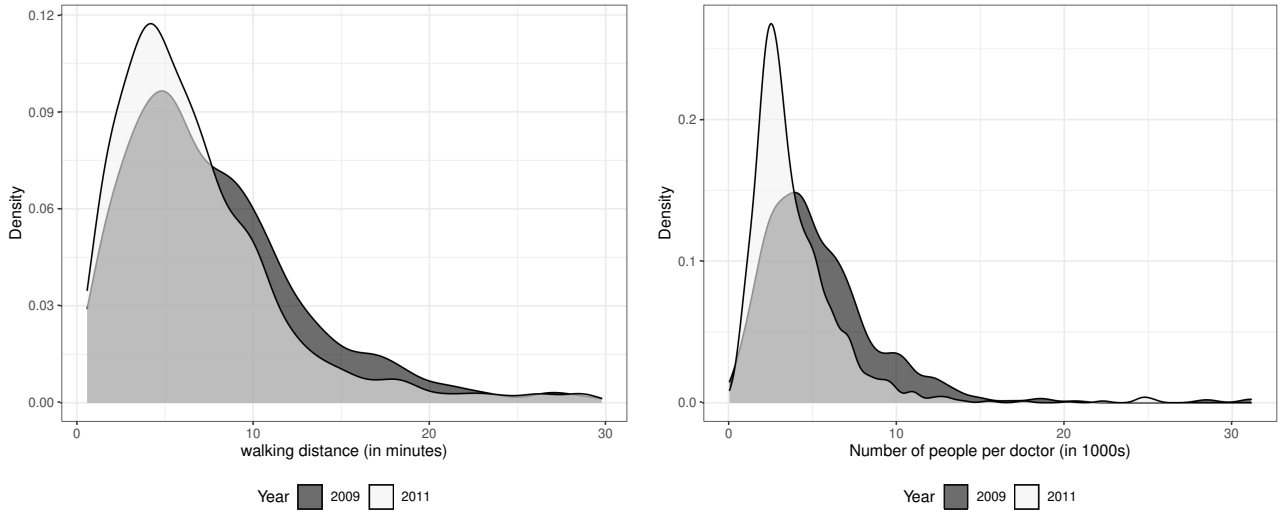
[20]Extreme values are driven mainly by rural areas located in Northern Istanbul. As a result, when walking distances are calculated, some values turn out to be extreme since the distances between polling units and FHCs are large because the population in these rural neighborhoods is sparse, falling below the 3,500 citizen threshold. The bottom percentile comprises 46 polling centers clustered in 42 neighborhoods where walking minutes to the nearest FHC is less than half a minute. These are mostly complexes of public buildings where existing buildings have been designated as FHCs next to schools. The results remain unchanged without the sample restrictions.

[21]Note that in some cases, the FHCs were closed, and the distance to the nearest FHC has increased.



(a) Pre-reform distribution of clinics and polling stations. (b) Post-reform distribution of clinics and polling stations.

Figure 2: Pre and post-reform distribution of polling stations and local health clinics in Umraniye district, Istanbul. Lines show neighborhood borders.



(a) Walking times to the closest FMC, 2009 and 2011.

(b) Number of people per doctor, 2009 and 2011.

Figure 3: Proximity to and the congestion of primary health care services in Istanbul, before and after the Family Medicine Reform.

to the nearest FHC, as well as the number of people per doctor (in 1000s), pre and post-reform. As these figures demonstrate, after the implementation of the reform, more individuals enjoyed closer primary health care services with less congestion (measured by the number of people per doctor).

Table 1 provides some key summary statistics from our data. We present the means by election years for some pre-reform polling center level electoral characteristics and neighborhood-level (*mahalle seviyesi*) demographic characteristics.

Election	2009 PC	2011
Polling Station-Level Characteristics		
AKP Vote Share	38.18	47.51
AKP Vote Margin	1.55	14.06
Walking minutes	13.59	11.82
Persons/doctor	5,508	3,955
Turnout	82.38	86.63
Voters Registered	5,282	5,610
Neighborhood-Level Characteristics		
Neighborhood Population	22,636	24,129
% University Graduates	9.12	10.96
Private Hospitals	0.21	0.20
Public Hospital (0,1)	0.04	0.05
Old Dependency Ratio	9.00	9.17
Young Dependency Ratio	32.01	31.23
Median Land Value, 2009	220.64	211.62
Observations	1,620	1,635

Table 1: Means by election year, unit of observation is polling center. Persons/doctor shows the catchment area population measured by the total number of voters registered in the catchment area of each FHC, divided by the number of doctors in the FHC. PC refers to Provincial Council election results.

5 Empirical Evidence

We assess voter responses to changes in distance to the local health services using a first-differences model. For each polling station i in neighborhood j at election year t, we estimate the following regression equation:

$$\Delta AKPvotes_{ijt} = \beta \Delta Walk_{ijt} + \lambda \Delta X_{jt} + \gamma H_{j,2009} + \Delta \varepsilon_{ijt} \tag{1}$$

Our outcome of interest is $\Delta AKPvotes_{ijt}$, the change in AKP's vote share from the preceding election, $\Delta Walk_{ijt}$ denotes the change in the accessibility measured by the change in minutes to walk to the nearest

FHC, X_{jt} is a matrix of time-varying socio-economic controls at the neighborhood (*mahalle*) level (first-differences of population, the share of university graduates, number of private hospitals and state hospitals, old and young dependency rates), $H_{j,2009}$ controls for the neighborhood's median property value in 2009.[22] The coefficient of interest, β, measures the elasticity of support for the incumbent party to changes in geographic proximity to health care centers in a given election year. Polling centers are nested within neighborhoods, so we present results with standards errors clustered at the polling center and also at the neighborhood level. First-differences control for unmeasured characteristics of polling centers that are constant over time, and as long as $cov(\Delta\varepsilon_{ijt}, \Delta Walk_{ijt}) = 0$ holds, β will be consistent.

We also control for some important time-varying covariates, ΔX_{jt}. Recall that these covariates are at the neighborhood *(mahalle)* level, the smallest administrative unit in Turkey. We control for the election-to-election changes in population, as well as changes in old and young dependency rates since neighborhoods can have different population dynamics that can affect their electoral response to new health clinics. For instance, neighborhoods experiencing high rates of population growth might not display electoral response to a newly built health clinic due to congestion. Or, the electoral effect of a new clinic can be more dramatic in neighborhoods with higher rates of old or young dependent population, which are captured by our old and young dependency ratio variables, since older people or families with young kids might use these clinics more frequently than the rest. Moreover, we control for the election-to-election changes in the share of university graduates, because decreased distance to a public service can also serve as an information treatment by increasing the visibility of the government's public service provision. Therefore, new health clinics could have more dramatic electoral effect in neighborhoods with low education level on average. Also, literature on Turkish politics consistently finds that less-educated voters vote for the AKP, whereas more educated voters vote for the CHP, the main opposition party (Cinar, 2016). Therefore, to rule out that any changes within polling station level vote-shares of the AKP are due to changes in the education level of the voters, we include this time-variant control variable in our analysis. Finally, as an additional neighborhood-level control, we include the median neighborhood property value in 2009, $H_{j,2009}$, in our regressions. We use pre-reform (2009) property values because new health clinics can potentially affect property values which would mean conditioning on a post-treatment variable, making the time-variant property values a bad control.

Table 2 presents the main results. First four models use municipal council election results while the last

[22]Note that the covariates are also differenced to capture change over time. The first-differences model absorbs time-invariant polling station level confounders.

five use provincial council election results as baseline. Models 4 and 8 use our alternative walking time measure which is computed using the centroids of Thiessen polygons in place of the geo-location of schools. Models 2, 3, 6, and 7 add time-varying neighborhood-level controls while models 3 and 7 include additional baseline controls as well (pre-reform AKP vote share and walking minutes in levels).[23] Model 9 reports results with spatially adjusted standard errors (Conley, 1999).

Consistent with our expectations, there is a negative and statistically significant association between changes in walking times and changes in AKP's vote share, robust to changes in socio-economic characteristics and election-specific shocks. Furthermore, the results indicate that voters exposed to an improvement in proximity to health care rewarded the incumbent, while those who now had to travel farther punished the incumbent party. Coefficients reported in Table 2 suggest that a 10-minute decrease in walking time to the nearest clinic is associated with an increase in the AKP vote share around 0.9 percentage points. Alternatively, a single standard deviation decrease in walking minutes (from 2009 to 2011) corresponds to a 0.81pp increase in AKP's vote share.

The magnitude of the coefficient is also economically significant: when we simulate the 2011 general election results for all three electoral districts in Istanbul, the estimated change corresponding to a mean decrease of 2 minutes, 10 minutes, and one standard deviation of walking time from each polling center to the nearest FHC translate into an additional seat at the general assembly in election district 3.[24] These vote changes are large enough to swing the victory in competitive elections such as the March 2019 local elections. The current mayor of Istanbul, Ekrem İmamoğlu, beat his competitor by only 13,729 votes. A 2-minute decrease in walking time brings about more than 15,000 votes in total, which is enough to change the winning mayor in a city with 10 million voters. Note that the estimates constitute a lower bound for the aggregate impact of the reform since (i) they only reflect the proximity effect, and (ii) we report mean effects of a programmatically implemented reform that improves (primary) health care provision for all citizens. We therefore believe that this is a compelling interpretation and an economically significant effect.

[23]Results remain unchanged when we include AKP's 2007 vote share as additional control (see Table A.8 in the Appendix). This analysis falsifies mean reversion concern.

[24]In Turkey's local and general Elections, municipal council members and members of the parliament are elected through the d'Hondt method, a proportional representation electoral system.

	Outcome: Δ AKP vote share								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ Walking time	-0.090**	-0.090**	-0.101**		-0.078**	-0.078**	-0.089**		-0.078**
	(0.036)	(0.036)	(0.041)		(0.032)	(0.032)	(0.035)		(0.035)
Δ Walking time (centroid)				-0.089***				-0.073**	
				(0.033)				(0.029)	
Observations	1,295	1,295	1,277	1,287	1,295	1,295	1,277	1,287	1,295
R-squared	0.122	0.122	0.128	0.123	0.132	0.132	0.147	0.132	0.132
Covariates	YES	YES	YES	YES	YES	YES	YES	YES	YES
Baseline Controls	NO	NO	YES	NO	NO	NO	YES	NO	NO
Cluster	Poll Station	Neighborhood	Poll Station	Poll Station	Poll Station	Neighborhood	Poll Station	Poll Station	Spatial
Elec2009	MC	MC	MC	MC	PC	PC	PC	PC	PC

Table 2: First-difference regression estimates of change in the AKP vote share (2011-2009) on change in walking minutes to the nearest FHC. Columns 1-4 use the municipal council (MC) votes, and columns 5-9 use provincial council (PC) votes as baseline. Neighborhood-level controls include first-differences of population, the share of university graduates, number of private hospitals, presence of a public hospital, old and young dependency rates, and median property value in 2009. Baseline controls consist of pre-reform (2009) levels of AKP vote share (in the considered election) and walking minutes to the nearest FHC. Standard errors are clustered at the indicated levels, with column 9 reporting spatially adjusted standard errors à la Conley (1999). *** p<0.01, ** p<0.05, * p<0.1

Next, to ascertain whether changes in the support for the incumbent are driven through changes in political competition or voter mobilization, we investigate two additional electoral outcomes: differences in AKP's vote margin,[25] and voter turnout. Results reported in Table 3 show that improved access to primary health care centers is associated with substantial decreases in political competition in favor of the incumbent party. We do not find a significant relationship between changes in walking times to the FHCs and turnout at the polling station level.

	Outcome			
	Δ *AKP vote margin*		Δ *Turnout*	
	(1)	(2)	(3)	(4)
Δ Walking time	-0.182***	-0.141***	0.000	0.005
	(0.057)	(0.050)	(0.021)	(0.021)
Observations	1,295	1,295	1,295	1,295
R-squared	0.091	0.094	0.055	0.057
Covariates	YES	YES	YES	YES
Elec2009	MC	PC	MC	PC

Table 3: First-difference regression estimates of change in AKP vote margin and voter turnout on change in walking minutes to the nearest FHC, comparing 2009 and 2011 elections. Columns 1 and 3 use the municipal council (MC) votes, and columns 2 and 4 use provincial council (PC) votes as baseline. Neighborhood-level controls include first-differences of population, the share of university graduates, number of private hospitals, presence of a public hospital, old and young dependency rates, and median property value in 2009. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

5.1 Heterogeneity by Socio-Economic Characteristics

To test whether the changes in clinic proximity disproportionately affect election results in places where voters are more likely to use public local health clinics, we investigate heterogeneous electoral responses. First, we interact the logarithm of median property value with the change in walking minutes. To prevent any endogeneity concerns arising from simultaneous causal effects of the health care reform on property values; we use pre-reform property values.

[25]The AKP's vote margin is operationalized as the vote share difference between the AKP and the party with the closest votes.

Hainmueller, Mummolo and Xu (2019) posit that the assumption of linear interaction effects does not hold in many political science applications, causing scholars to draw conclusions that rest on a modeling artifact. Following their guidelines, we test the assumptions of linearity, and use binning and kernel estimators to quantify interaction effects where the linearity assumption cannot be validated. The binning estimator, which offers a more flexible modelling option by showing the conditional marginal effects at different values of the moderator, provides a formal test of the linearity assumption and presents evidence against the linear multiplicative interaction model (p-value for Wald test = 0.012).[26]

Following Hainmueller, Mummolo and Xu (2019), for each polling station i in neighborhood j at election year t, we estimate the following flexible binning estimator model:

$$\Delta AKPvotes = \sum_{k=1}^{3} \left\{ \mu_k + \alpha_k \Delta Walk + \eta_k (H_{2009} - h_{k,2009}) + \beta_k (H_{2009} - h_{k,2009}) \Delta Walk \right\} G_k + \lambda \Delta X + \varepsilon \quad (2)$$

where $G_k, k = \{1,2,3\}$ are the dummy variables for each bin. They are defined with respect to the terciles of the pre-reform property value distribution. The median value of pre-reform property value for each bin $h_{k,2009}$ is subtracted from pre-reform property value H_{2009} so that α_k can be interpreted as the conditional marginal effect of $\Delta Walk$ on our outcome $\Delta AKPvotes$ at the chosen evaluation points (the median property values) at each bin. We report these coefficients in Table 4 below.[27] The other two interaction terms in the equation allow us to see the changing effects of $\Delta Walk$ within each bin dummies (Hainmueller, Mummolo and Xu, 2019). We also control for the same important time-varying covariates, ΔX as defined before.

Table 4 presents the results from the binning estimators, which are also plotted in Figure 4.[28] The results presented in Table 4 indicate that the electoral returns to proximity is more pronounced in poorer neighborhoods since the coefficient on the interaction between ΔWalk and pre-reform property values is negative and statistically significant in poorest neighborhoods defined as the lowest tercile in property value distribution.

[26] If we could verify the linearity assumptions, we would prefer using a linear model as opposed to a binning estimator because the linear model is more efficient.

[27] The coefficients for the predictor and the moderator exist in the model but have not been reported in Table 4 due to space limitations. Appendix Table A.15 reports all the estimated coefficients from equation 2.

[28] See Appendix Figure A.1 for a non-parametric approach: the kernel smoothing estimator for the same conditional marginal effect.

Outcome: Δ AKP vote share		
	(1)	(2)
ΔWalk*PropertyValue2009 (=low)	-0.152**	-0.135**
	(0.066)	(0.06)
ΔWalk*PropertyValue2009 (=medium)	-0.122	-0.12
	(0.086)	(0.078)
ΔWalk*PropertyValue2009 (=high)	-0.017	-0.005
	(0.087)	(0.079)
Observations	1,295	1,295
Covariates	YES	YES
Elec2009	MC	PC

Table 4: First-difference binning estimates of change in the AKP vote share (2011-2009) on change in walking minutes to the nearest FHC. Column 1 uses the municipal council (MC) votes, and column 2 uses provincial council (PC) votes as baseline. Interactions of change in walking minutes with pre-reform median property value are reported. The moderator is the PropertyValue2009, which denotes the logarithm of the median property value in the neighborhood in 2009. It is divided into three bins based on the terciles of its distribution and interacted with ΔWalk. These models also include the interaction between the bin dummies and the PropertyValue2009 minus the evaluation points of the binning estimators, as well as the triple interactions. These two interaction terms (not reported here) allow us to see the changing effect of ΔWalk within each bin dummies (Hainmueller, Mummolo and Xu, 2019). Other neighborhood-level controls include first-differences of population, the share of university graduates, old and young dependency rates, the number of private hospitals, and presence of a public hospital. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

We visualize these results in Figure 4. Using Model 2 in Table 4, Figure 4 plots the marginal effects of change in walking time by pre-reform property values. It illustrates that improved walking distance to health services is positively associated with a change in support for the AKP, mainly for polling stations in low pre-reform property value neighborhoods.

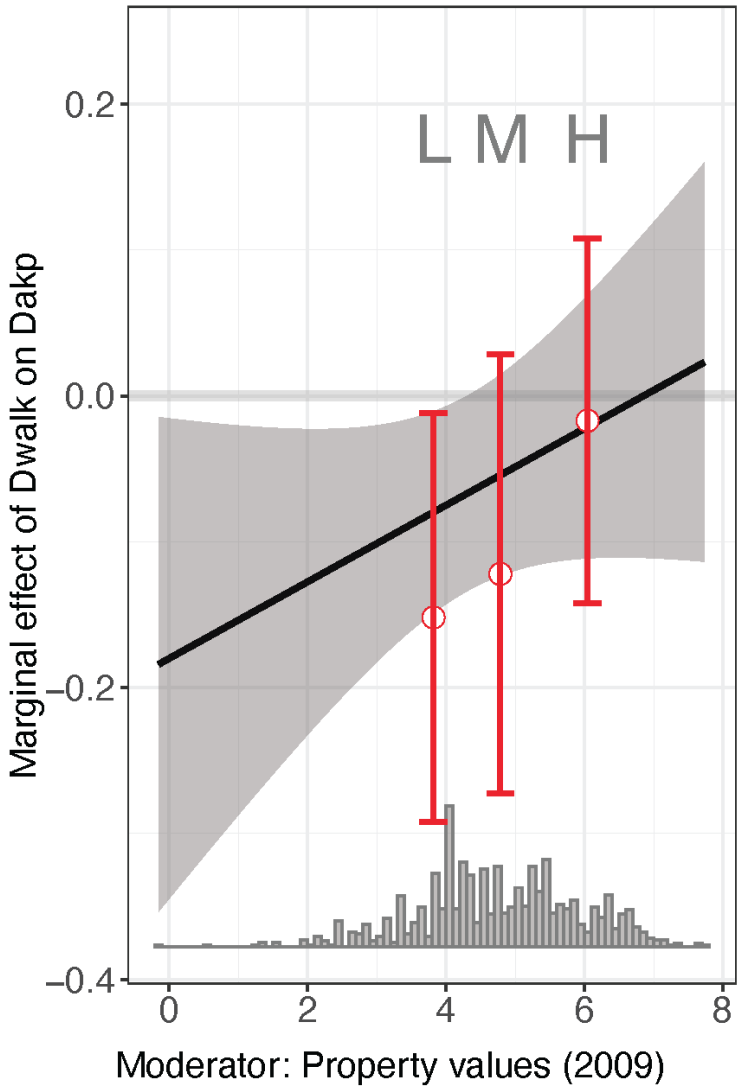


Figure 4: Conditional marginal effects of ΔWalk on ΔAKP using binning estimator (3 bins, the estimates are the medians of each bin). The moderator is property values in 2009 (logged). The shaded upward sloping line is the conditional marginal effects from the linear multiplicative model.

5.2 Improvements in Service and Electoral Returns

In the main analysis, we have established that improvements in geographical access to primary health care centers increases (and lower geographical accessibility decreases) votes of the AKP. However, as explained in the institutional section, the reform has also improved quality of health care in some localities, by capping the maximum number of patients per family physician. Do changes in doctor-patients ratio, in other words, improvements in congestion, change support for the incumbent? In this section, we shed light into this question.

We have collected data on the number of doctors working both at the pre-reform and post-reform FHCs

from the webpage of Istanbul Directorate of Health Services. To measure congestion, we compute the catchment area population by summing over the voters registered to the polling centers matched to a given FHC, divided by the number of actively working doctors at the FHC. We divide this ratio by 1,000 and use the "1,000 persons per doctor" as our measure of congestion. In Table 5, we examine the effects of changes in congestion on the changes in AKP vote-share. The results show that decreases in congestion translate into more votes for AKP. 1 standard deviation decrease in congestion (around 4218 less patients per doctor) increase AKP votes by around 4% (or 3.8 percentage points).

	Outcome: Δ AKP vote share			
	(1)	(2)	(3)	(4)
Δ Congestion	-0.096**	-0.090**	-0.091***	-0.079**
	(0.037)	(0.038)	(0.034)	(0.034)
Observations	1,182	1,182	1,182	1,182
R-squared	0.113	0.117	0.124	0.137
Covariates	YES	YES	YES	YES
Baseline Controls	NO	YES	NO	YES
Elec2009	MC	MC	PC	PC

Table 5: First difference regression estimates of change in AKP vote share (2011-2009) on change in congestion in the nearest FHC, measured by 1,000 persons in the catchment area of FHC divided by the number of doctors. Columns 1-2 use the municipal council (MC) votes, and columns 3-4 use provincial council (PC) votes as baseline. Neighborhood-level controls include first-differences of population, the share of university graduates, number of private hospitals, presence of a public hospital, old and young dependency rates, and median property value in 2009. Baseline controls consist of pre-reform (2009) levels of AKP vote share (in the considered election). *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Do better doctor-patient ratios influence electoral choices of the poor? We explore heterogeneous effects of improvements in congestion by pre-reform property values of the neighborhoods.[29] Since the test of the linearity assumption presents evidence against the linear multiplicative interaction model (p-value: 0.011), we again employ binning and kernel smoothing estimators to uncover the conditional marginal effects of congestion on voting results. Figure 5 plots the marginal effect of congestion by pre-reform property values.

[29]We also investigated the heterogeneous effects of improvements in congestion by dependency. The results (not reported here) show that dependency does not have a moderating effect.

The binning estimators, which is less efficient than the linear multiplicative model as shown in the shaded upward sloping line, show no significantly differential effects. The kernel estimator results in Appendix Figure A.2, on the other hand, show a significant negative effect for the left tail of the property value distribution. We do not find consistent results overall.

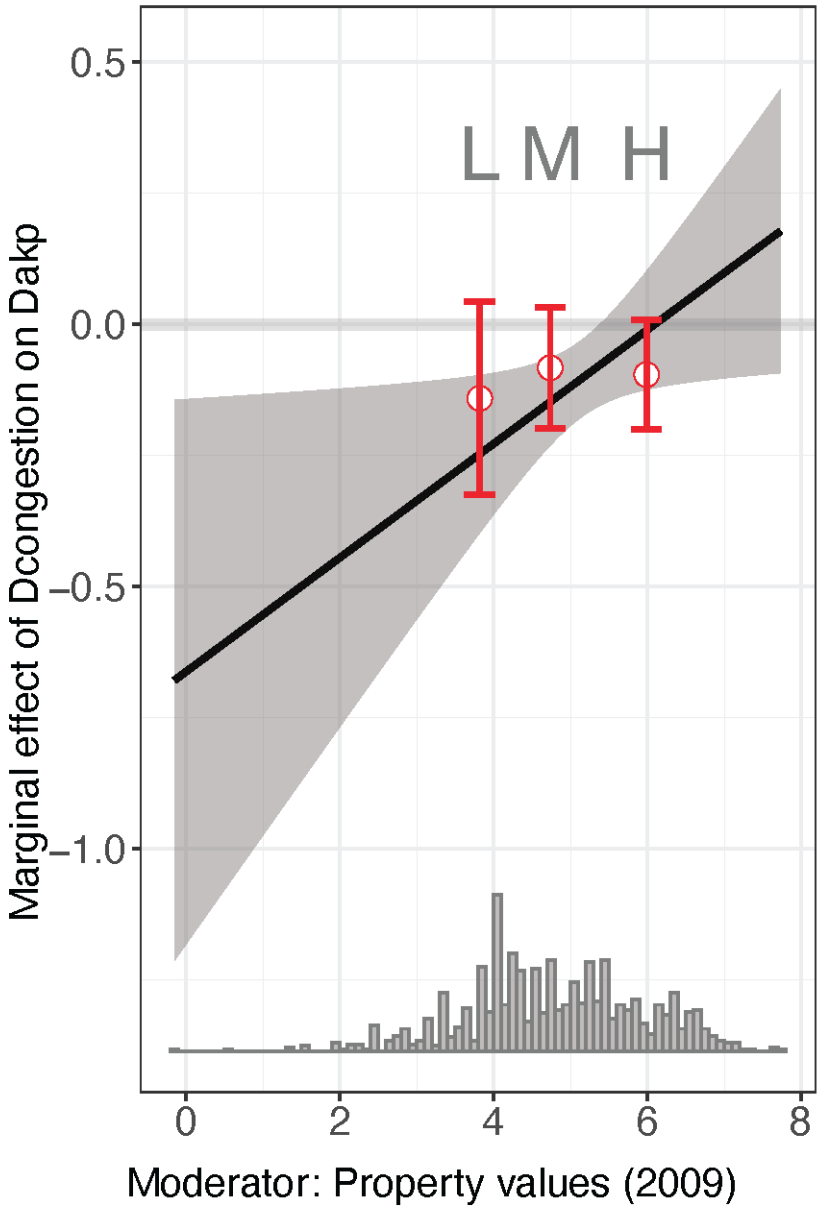


Figure 5: Conditional marginal effects of ΔCongestion on ΔAKP using binning estimator (3 bins, the estimates are the medians of each bin). The moderator is property values in 2009 (logged). The shaded upward sloping line is the conditional marginal effects from the linear multiplicative model.

5.3 Validity and Robustness Checks

Throughout the paper, we argued that the new clinics were built based on a population threshold rule, and their locations were determined independently of political influence. To validate these assumptions, we begin by presenting empirical tests showing no significant relationship between correlates of pre-reform AKP support, socio-economic characteristics, and new clinics.

First, to rule out the possibility that new health clinics were targeted to specific communities with characteristics that may correlate with AKP support, we conduct several empirical tests. To validate the claim that the reform was implemented programmatically, i.e., based on need, we construct a proxy for pre-reform "need for doctors", which measures the deviation from the targeted patient per doctor threshold of 3,500. Table A.1 shows that the pre-reform need for doctors significantly predict the post-reform number of doctors, corroborating that the reform was implemented programmatically and not based on pork barrel. Second, to rule out that the incumbent specifically targeted these health clinics to swing voter districts to gain more support in the upcoming elections, we investigate whether swing districts received more family physicians than others. Table A.2 investigates further political motives in providing health care, testing whether swing polling stations with a similar need for health care to others disproportionately received more doctors. We find no empirical evidence that AKP targeted new clinics in swing localities.

We also considered that the incumbent party might favor its loyal supporters at the local level to maximize its probability of being re-elected. For this purpose, we investigated whether voters residing in an AKP municipality pre-reform (elected in 2009) benefited from the reform asymmetrically. To test whether a clientelistic channel is at work, we investigate whether municipalities with an AKP-affiliated mayor before the reform had a positive relationship with decreases in the walking time to the closest FHC after the reform. Table A.3 shows no statistically significant evidence that the incumbent party has rewarded its loyal municipalities with improved proximity to health care. Also, Table A.10 shows that the pre-trends (2007-2009) in AKP vote share or vote margin do not predict post-reform (2009-2011) changes in proximity to health care.

To rule out the possibility that health care reform disproportionately targeted poorer areas, in Table A.13, we test the validity of the assumption that exposure to treatment (improved access to health care) is orthogonal to socio-economic characteristics. Table A.13 reports the result from the regressions of our treatment variable, change in walking time to the nearest clinic, on pre-reform property values (controlling for the residents' wealth). Again, we detect no statistically significant relationship, eliminating the concern that new

clinics were explicitly built in poorer neighborhoods, possibly more likely to support AKP for reasons other than public health care.

Our last validity check explores the possibility of geographic targeting in polling stations where the closest FHC was built by the government rather than rented by the family physician through market operations. As explained in the previous sections, after implementing the reform, new clinics have rapidly opened, using either existing vacant public buildings or by family physicians renting apartments in already existing buildings ("virtual FHC's"), with minimal government intervention. In Table A.4, we prove that there was no differential effect of pre-reform AKP vote share in determining the post-reform change in proximity by building type.

In Appendix Section B, we present a battery of robustness checks. First, we devised an alternative mode of measurement for walking times where we identified the three closest health clinics to each school (instead of matching to the closest clinic based on great circle distance). We then calculated the walking distance and time to each of these three clinics via Google Maps API, matching the school building to the clinic with minimum walking time.[30] Table A.5 replicates the primary analysis using this alternative measure and confirms that the results are not sensitive to the mode of measurement.

Next, we exclude rural districts of Çatalca and Şile, the districts with the highest number of villages, from the analysis. We speculate that it might have been easier to find vacant lots to build new clinics in rural areas, inducing the government to build clinics where the electoral returns might be maximum. Results reported in Table A.6 confirm that our main results continue to hold statistically and economically when we exclude rural districts.

Moreover, Table A.7 reports results from a specification with district (*ilçe*) fixed effects. Recall that polling stations are nested in neighborhoods, which, in turn, are located within districts that make up a city. Even though first-difference models consider the time-invariant or slow-moving confounders, we add district fixed effects to our primary analysis as an additional robustness check. Table A.7 confirms that our results are robust to controlling for time-invariant district-specific heterogeneity. Although our baseline election, 2009, is a local election with unusually low support for the AKP, and we would have preferred to use the previous general election in 2007 as the baseline, it deems infeasible as no data exists on the geospatial distribution of health care clinics in 2007. So instead, in Table A.8, we control for the AKP's vote share in the 2007

[30]Note that the closest health clinic to each polling station in terms of great circle distance does not necessarily mean the closest health clinic in walking time because of physical and geographical barriers.

elections as the baseline electoral support and show the robustness of our results.

Table A.9 adds a proxy for pre-reform need for doctors (as defined in Appendix Section A.1). Again, the results are robust, implying that proximity and support for the incumbent go hand-in-hand in places with a similar pre-existing need for health care.

Finally, to ensure that changes in proximity to health care drive the observed changes in AKP support, we conducted two placebo tests. In the first one, we focused on the period between 2011 and 2014. In this post-reform period, the change in walking times remained reasonably stable since the reform had already successfully met the 3500 patient ratios in many locations by 2011. If some other unobserved factors drive the results, then we should observe a similar effect even in this period, even though proximity to health care did not improve. The results documented in Table A.11 show no statistically significant effect, giving more credence to our results that increased (worsened) accessibility in health care increased (decreased) the support for the incumbent.

Secondly, we use the current change in walking times and congestion (2009-2011) to predict prior electoral trends (2007-2009). In Table A.12, we re-estimate our main specification using as outcome the lagged (2007-2009) change in AKP vote share. Reassuringly, we detect no statistically significant coefficients with fairly large p-values.

6 Conclusion

In this article, we have focused on the political economy of catchment areas of public services. Specifically, we investigated electoral responses to decreases in walking times to the closest local health clinics in Istanbul, Turkey. We have found consistent evidence that increases in accessibility to local health clinics improve the electoral performance of the incumbent in the context of elections in Istanbul, Turkey. Our results show that a ten-minute decrease in walking time from a polling station to the nearest clinic raised the vote share of the Justice and Development Party in Turkey (AKP) by about 0.9 percentage points in that polling unit. We also demonstrate that poorer neighborhoods disproportionately reward the AKP when the local health clinic moves closer, compared to those who are wealthier and less likely to use local health clinics. Additionally, our results show that decreases in the doctor/population ratio, i.e., the congestion of local health clinics, significantly increases votes for the politician. Our findings are robust to the inclusion of socio-economic and political controls.

Throughout the article, we have emphasized the importance of examining public service provision in spatial contexts. We proposed that voters experience changes in accessibility to governmental service providers beyond gaining "full-access" on paper. Because geographical distances between the communities and service providers vary widely within formally defined sub-national units (such as districts, counties, or states), decreases in commuting time to a service should positively affect one's assessment of the government performance. By examining the influence of geographic inequalities on the changes of incumbent's vote-share, our theory builds upon and extends existing research on democratic accountability.

While we analyze data from one country, changes in accessibility to public services should similarly influence electoral support for the incumbents because geographic proximity resolves many obstacles that have been identified as the breakers of the social contract between the voters and the incumbents. A prominent line of literature identifies the limited availability of information on the political process and politician performance among voters as the main driver of the persistent electoral victory of low-quality politicians, especially in developing countries (Besley, 2006; Gottlieb, 2016). Experimental literature that sought to identify the effects of information on enhancing democratic accountability reports that providing voters with information on politician performance may nudge them to vote for better performers (Pande, 2011). Decreased distance to a public service can also serve as an *information treatment* by increasing the visibility of the government's work. In the absence of complete information on politician's programmatic efforts to increase citizen welfare, everyday interaction between an individual and a public service provider, which is only possible through geographic proximity, becomes an essential factor in shaping voters' perceptions of government's efforts. Further investigations of electoral responses to increased access to public services through a spatial framework can inform us of the effects of informational asymmetries on democratic accountability.

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References

Agartan, Tuba I. 2015. "Explaining Large-Scale Policy Change in the Turkish Health Care system: Ideas, Institutions, and Political Actors." *Journal of Health Politics, Policy and Law* 40(5):971–999.

Akarca, Ali T and Aysit Tansel. 2006. "Economic performance and political outcomes: An analysis of the Turkish parliamentary and local election results between 1950 and 2004." *Public Choice* 129(1-2):77–105.

Akdag, Recep. 2009. *Health Transformation Program in Turkey - Progress Report*. Ankara: The Ministry of Health of Turkey.

Albertus, Michael. 2019. "Theory and Methods in the Study of Distributive Politics." *Political Science Research and Methods* 7(3):629–639.

Alesina, Alberto, Reza Baqir and William Easterly. 1999. "Public Gods and Ethnic Divisions." *Quarterly Journal of Economics* 114(4):1243–1284.

Ascencio, Sergio J and Miguel R Rueda. 2019. "Partisan poll watchers and electoral manipulation." *American Political Science Review* 113(3):727–742.

Ashworth, Scott. 2012. "Electoral Accountability: Recent Theoretical and Empirical work." *Annual Review of Political Science* 15:183–201.

Atun, Rifat, Sabahattin Aydın, Sarbani Chakraborty, Safir Sümer, Meltem Aran, Ipek Gürol, Serpil Nazlıoğlu, Şenay Özgülcü, Ülger Aydoğan, Banu Ayar et al. 2013. "Universal Health Coverage in Turkey: Enhancement of Equity." *The Lancet* 382(9886):65–99.

Baldwin, Kate and John D Huber. 2010. "Economic versus Cultural Differences: Forms of Ethnic Diversity and Public Goods Provision." *American Political Science Review* 104(4):644–662.

Baris, Enis, Salih Mollahaliloglu and Sabahattin Aydin. 2011. "Healthcare in Turkey: from Laggard to Leader." *British Medical Journal* 342:579–582.

Barro, Robert J. 1973. "The Control of Politicians: an Economic Model." *Public Choice* 14:19–42.

Baum, Matthew A and David A Lake. 2003. "The Political Economy of Growth: Democracy and Human Capital." *American Journal of Political Science* 47(2):333–347.

Besley, Timothy. 2006. *Principled Agents?: The Political Economy of Good Government*. Oxford: Oxford University Press.

Brinkerhoff, Derick W, Anna Wetterberg and Erik Wibbels. 2018. "Distance, Services, and Citizen Perceptions of the State in Rural Africa." *Governance* 31(1):103–124.

Burgess, Robin, Remi Jedwab, Edward Miguel, Ameet Morjaria and Gerard Padró i Miquel. 2015. "The Value of Democracy: Evidence from Road Building in Kenya." *American Economic Review* 105(6):1817–51.

Bursztyn, Leonardo. 2016. "Poverty and the Political Economy of Public Education Spending: Evidence from Brazil." *Journal of the European Economic Association* 14(5):1101–1128.

Cantú, Francisco. 2019*a*. "The fingerprints of fraud: Evidence from Mexico's 1988 presidential election." *American Political Science Review* 113(3):710–726.

Cantú, Francisco. 2019*b*. "Groceries for votes: The electoral returns of vote buying." *The Journal of Politics* 81(3):790–804.

Çarkoğlu, Ali. 2009. "Turkey's local elections of 2009: winners and losers." *Insight Turkey* pp. 1–18.

Cesur, Resul, Pınar Mine Güneş, Erdal Tekin and Aydogan Ulker. 2017. "The Value of Socialized Medicine: The Impact of Universal Primary Healthcare Provision on Mortality Rates in Turkey." *Journal of Public Economics* 150:75–93.

Cinar, Kursat. 2016. "Local determinants of an emerging electoral hegemony: The case of Justice and Development Party (AKP) in Turkey." *Democratization* 23(7):1216–1235.

Conley, Timothy G. 1999. "GMM estimation with cross sectional dependence." *Journal of econometrics* 92(1):1–45.

Cox, Gary W and Mathew D McCubbins. 1986. "Electoral Politics as a Redistributive Game." *The Journal of Politics* 48(2):370–389.

De Kadt, Daniel and Evan S. Lieberman. 2020. "Nuanced Accountability: Voter Responses to Service Delivery in Southern Africa." *British Journal of Political Science* 50(1):185–215.

Dixit, Avinash and John Londregan. 1996. "The Determinants of Success of Special Interests in Redistributive Politics." *the Journal of Politics* 58(4):1132–1155.

Fearon, James D. 1999. *Democracy, Accountability, and Representation*. Cambridge, MA: Cambridge University Press chapter Electoral Accountability and the Control of Politicians: Selecting Good Types versus Sanctioning Poor Performance, pp. 55–97.

Gage, Anastasia J and Marie Guirlène Calixte. 2006. "Effects of the physical accessibility of maternal health services on their use in rural Haiti." *Population studies* 60(3):271–288.

Golden, Miriam and Brian Min. 2013. "Distributive Politics Around the World." *Annual Review of Political Science* 16:73–99.

Gonzalez-Ocantos, Ezequiel, Chad Kiewiet De Jonge, Carlos Meléndez, Javier Osorio and David W Nickerson. 2012. "Vote Buying and Social Desirability Bias: Experimental Evidence from Nicaragua." *American Journal of Political Science* 56(1):202–217.

Gottlieb, Jessica. 2016. "Greater Expectations: A Field Experiment to Improve Accountability in Mali." *American Journal of Political Science* 60(1):143–157.

Hainmueller, Jens, Jonathan Mummolo and Yiqing Xu. 2019. "How Much Should We Trust Estimates from Multiplicative Interaction Models? Simple Tools to Improve Empirical Practice." *Political Analysis* 27(2):163–192.

Harding, Robin. 2015. "Attribution and Accountability: Voting for Roads in Ghana." *World Politics* 67(4):656–689.

Huber, Evelyne, Thomas Mustillo and John D Stephens. 2008. "Politics and Social Spending in Latin America." *The Journal of Politics* 70(2):420–436.

Ichino, Nahomi, Martin Williams and Erik Wibbels. 2018. "The Political Geography of Government Projects: Evidence from+/-40,000 Projects in Ghana.".

URL: *https://www.aiddata.org/publications/the-political-geography-of-government-projects-evidence-from-40-000-projects-in-ghana*

Ichino, Nahomi and Noah L Nathan. 2013. "Crossing the line: Local ethnic geography and voting in Ghana." *American Political Science Review* 107(2):344–361.

Imai, Kosuke, Gary King and Carlos Velasco Rivera. 2020. "Do Nonpartisan Programmatic Policies Have Partisan Electoral Effects? Evidence from Two Large-Scale Experiments." *The Journal of Politics* 82(2):000–000.

Incioglu, Nihal. 2002. *Local Elections and Electoral Behaviour*. London: Lynne Rienner Publishers chapter Politics, Parties, and elections in Turkey, pp. 73–90.

Istanbul Kalkinma Ajansı. 2010. 2010–2013 Istanbul Bölge Planı. Technical report Istanbul Kalkınma Ajansı.

Kalaycıoğlu, Ersin. 2014. "Local elections and the Turkish Voter: Looking for the Determinants of Party Choice." *South European Society and Politics* 19(4):583–600.

Kumar, Tanu, Alison E Post, Isha Ray, Megan Otsuka and Francesc Pardo-Bosch. 2021. "From Public Service Access to Service Quality: The Distributive Politics of Piped Water in Bangalore.".

Kustov, Alexander and Giuliana Pardelli. 2018. "Ethnoracial homogeneity and public outcomes: The (non) effects of diversity." *American Political Science Review* 112(4):1096–1103.

Larreguy, Horacio, John Marshall and Pablo Querubin. 2016. "Parties, brokers, and voter mobilization: How turnout buying depends upon the party's capacity to monitor brokers." *American Political Science Review* 110(1):160–179.

Lee, Dong Wook and Melissa Rogers. 2019. "Measuring Geographic Distribution for Political Research." *Political Analysis* 27(3):263–280.

Levitsky, Steven and Lucan A Way. 2010. *Competitive Authoritarianism: Hybrid Regimes After the Cold War*. Cambridge, MA: Cambridge University Press.

Majumdar, Sumon, Anandi Mani and Sharun W Mukand. 2004. "Politics, Information and the Urban Bias." *Journal of Development Economics* 75(1):137–165.

McLafferty, Sara and Sue Grady. 2004. "Prenatal care need and access: a GIS analysis." *Journal of medical systems* 28(3):321–333.

Min, Brian. 2019. "Political favoritism and the targeting of power outages." *International Growth Centre: London, UK* .

OECD-World Bank. 2008. *OECD Reviews of Health Systems: Turkey*. Paris: OECD Publishing.

O'Meara, WP, A Noor, H Gatakaa, B Tsofa, FE McKenzie and K Marsh. 2009. "The impact of primary health care on malaria morbidity–defining access by disease burden." *Tropical Medicine & International Health* 14(1):29–35.

Pande, Rohini. 2011. "Can Informed Voters Enforce Better Governance? Experiments in Low-Income Democracies." *Annual Review of Economics* 3(1):215–237.

Rodden, Jonathan. 2010. "The Geographic Distribution of Political Preferences." *Annual Review of Political Science* 13:321–340.

Stasavage, David. 2005. "Democracy and Education Spending in Africa." *American Journal of Political Science* 49(2):343–358.

Stepan, Alfred C. and Graeme B. Robertson. 2003. "An "Arab" More than a "Muslim" Democracy Gap." *Journal of Democracy* 14(3):30–44.

Stepan, Alfred and Graeme B Robertson. 2004. "Debate: Arab, Not Muslim, Exceptionalism." *Journal of Democracy* 15(4):140–146.

Tajima, Yuhki, Krislert Samphantharak and Kai Ostwald. 2018. "Ethnic Segregation and Public Goods: Evidence from Indonesia." *American Political Science Review* 112(3):637–653.

Tatar, Mehtap, Salih Mollahaliloğlu, Bayram Şahin, Sabahattin Aydin, Anna Maresso and Cristina Hernández-Quevedo. 2011. *Turkey: Health System Review*. Vol. 13 of *Health Systems in Transition* World Health Organization Regional Office for Europe.

Wang, Fahui, Sara McLafferty, Veronica Escamilla and Lan Luo. 2008. "Late-stage breast cancer diagnosis and health care access in Illinois." *The Professional Geographer* 60(1):54–69.

World Bank. 2013. Turkey Performance-Based Contracting Scheme in Family Medicine-Design and Achievement. Technical report Washington, DC: .

Yang, Duck-Hye, Robert Goerge and Ross Mullner. 2006. "Comparing GIS-based methods of measuring spatial accessibility to health services." *Journal of medical systems* 30(1):23–32.

Yu, Haiyue, Panpan Wang, Huan Zheng, Jifeng Luo and Jun Liu. 2020. "Impacts of congestion on healthcare outcomes: an empirical observation in China." *Journal of Management Analytics* 7(3):344–366.

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