



Hospital supply and infant mortality: Evidence from Islamic political representation in Turkey

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Abstract

We investigate the impact of healthcare facility supply on infant mortality by exploiting a change in local governments in Turkey as a quasi-exogenous shock to local hospital supply. Using a regression discontinuity design, we find a significant decline in infant mortality in municipalities where an Islamic mayor was barely elected. Exploring potential channels, we document a significant increase in the number and size of hospitals and health clinics in treated municipalities. Moreover, children in these municipalities are more likely to be born in government facilities, receive treatment for cough and fever, benefit from a greater number of childhood vaccinations, and have more prenatal care visits before birth. Our findings highlight that investments in public healthcare facilities in disadvantaged areas can have substantial effects on the survival of infants.

Keywords Health infrastructure · Hospitals · Infant mortality · Close elections · Turkey

JEL Classification I15 · I18 · I12

1 Introduction

Although many governments in the developing world have long had the objective of providing basic healthcare, several hundred million people still fail to receive primary

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health services.¹ Public health experts often attribute these health disparities to the limited availability of health facilities and professionals in disadvantaged areas of the world. The World Health Organization emphasizes that hospitals and health clinics are a critical component of delivering primary healthcare services, with increasing investments needed in rural and remote areas (Rechel et al. 2009; WHO 2021). Despite the widespread interest in increasing the availability of healthcare facilities in communities without access, there is little empirical evidence on whether increasing the supply of hospitals leads to improvements in public health, partly due to challenges in finding exogenous sources of variation in hospital supply across regions.² In this paper, we document a link between infant mortality and a large, plausibly exogenous shock to local hospital supply driven by a change in local governments in Turkey.

In 1994, Turkey experienced a fundamental political change in local election outcomes when the pro-Islamic Welfare Party (WP) won a large share of votes and became the second largest party in terms of representation. In its election campaign, the WP placed significant emphasis on investment in local healthcare provisions with the goal of improving the quality of health services accessed by disadvantaged groups (Akinci 1999; Kurt et al. 2018). Since Turkey is a secular country with a long history of democracy, the existence of fair elections allow the comparison of related outcomes in municipalities where an Islamic mayor barely won or lost local elections.³

We study whether infant mortality declined in municipalities where an Islamic mayor narrowly won against a secular candidate using a data set of approximately 2700 municipalities with election data in 1994 and the Demographic and Health Survey in 2003. To evaluate the potential channels, we examine the impacts of Islamic mayors on the supply of hospitals and health clinics using Building Census data in 2001, as well as individual-level health behaviors. We use a regression discontinuity (RD) design by exploiting close elections between secular and Islamic candidates. Using the discontinuity in the electoral win margin within a narrow bandwidth of close elections, we compare health outcomes and investments in municipalities where an Islamic mayor narrowly won the election (i.e., treatment locations) to those in municipalities where an Islamic mayor failed to win the election (i.e., control locations) at the point of discontinuity.⁴

We note upfront that there is no information on the central government's allocation of funding for local governments. In the absence of this data, we instead focus on exploring a multitude of potential channels driving our main results and examine the

¹ The World Health Organization (WHO) estimates about half of the world lacks access to essential health services and about 100 million fall into extreme poverty as a result of excessive health expenses (<https://www.who.int/news/item/13-12-2017-world-bank-and-who-half-the-world-lacks-access-to-essential-health-services-100-million-still-pushed-into-extreme-poverty-because-of-health-expenses>, last accessed on November 11, 2022).

² Most of the earlier literature on the relationship between healthcare resources and health outcomes provide correlational evidence (Kim and Moody 1992; Filmer and Pritchett 1999; McGuire 2006; Farag et al. 2013; Akinlo and Sulola 2019).

³ In contrast to several countries in the Middle East, Turkey's political history includes a longstanding tradition of multiple parties participating in elections, which have been free and fair since the 1950s (Gumuscu 2023).

⁴ Of the 2710 municipalities that existed during the 1994 Turkish local elections, 340 elected an Islamic mayor, while 2370 did not.

potential impact on healthcare infrastructure stemming from commitments made by Islamic mayors in the pre-election period.

We report three main results. First, our RD estimates show that local Islamic rule reduced infant mortality by 2.1 percentage points, a sizable impact relative to the control group mean of 3.2%. These effects are driven by reductions in infant deaths within the first month of birth. Second, examining potential channels, we find that the Islamic rule increased the number of healthcare facilities—primarily hospitals and health clinics—built between 1990 and 2000 by approximately 26% relative to the control group. Similarly, it increased the size of these facilities in terms of their area coverage (in m^2) by approximately 24% relative to the control group. We also document that the place of birth, the provision of antenatal care, curative treatments, and childhood vaccinations play an important role in explaining our results. The RD estimates indicate a 7 percentage point increase in infant births taking place at a government facility, a 17 percentage point increase in the probability of a child being treated for a cough or a fever, almost one additional vaccine received per child, and 0.8 additional prenatal care visits prior to birth.

We make several contributions to the existing literature. First, our study relates to the political economy literature that focuses on the effects of political parties (Ferreira and Gyourko 2009; Beland 2015) and the religious, ethnic, or gender identity of politicians. Our work is closely related to Meyersson (2014), who documents an increase in high school completion of young women in Turkey in municipalities that were exposed to an Islamic mayor. While our empirical strategy is similar, we use this political shock to examine the effects on child health outcomes, ruling out maternal education as a channel. Our work is also related to Bhalotra and Clots-Figueras (2014), who focus on close elections of female politicians against male counterparts in India, and find that increasing the share of female politicians in state assembly in India leads to substantial reductions in infant mortality. Our study differs from these papers in two respects. First, we focus on the effects of local Islamic representation on child health outcomes, whereas previous studies examined the effects of Islamic rule on education outcomes (Meyersson 2014). Second, while previous studies established that the identity of local politicians can matter in terms of child health outcomes (Bhalotra and Clots-Figueras 2014), these studies have not examined the role of religious identity, which we focus on in this paper.

Second, we show that the positive impacts of local availability of healthcare facilities on child health are substantial. Most of the previous studies that document the relationship between the supply of healthcare providers and healthcare utilization do not account for omitted variable bias (Grytten and Sørensen 2001; Busato and Kunzi 2008; Russo et al. 2019) and focus primarily on the supply of healthcare workers, including doctors, nurses, and physician assistants, instead of the supply of healthcare facilities. Studies using a quasi-experimental setup are rare. Among these, Carrillo and Feres (2019) show that a policy that expanded the supply of primary care physicians in Brazil did not significantly increase healthcare utilization and failed to reduce infant mortality.⁵ On the other hand, Okeke (2023) finds that the assignment of an additional

⁵ Using policy variation across U.S. states, Traczynski and Udalova (2018) find that the increasing the independence of nurse practitioners from physicians increases the frequency of routine checkups and improves quality of healthcare.

doctor to a public health center in Nigeria leads to the reduction of infant mortality. Focusing on the effects of rural hospital closures in the U.S., Battaglia (2022) and Fischer et al. (2022) find that closures of rural hospital maternity wards lead to a reduction in cesarean births for low-risk women with no evidence of a significant impact on infant health outcomes. Our empirical setup allows us to estimate the effects of an exogenous increase in the supply of healthcare facilities on child health indicators in a developing country context.

Third, our study contributes to an extensive literature on the effects of policies that aim to improve early life healthcare services and reduce health disparities. Most of these studies focus on demand-side interventions, including subsidized health insurance programs (Currie and Gruber 1996; Goodman-Bacon 2018), reductions in medical payments (Gruber et al. 2014; Thornton et al. 2010), and cash transfer programs (Aizer et al. 2016). Fewer studies examine the impacts of policies that alter the supply side of health provision. Among these, studies have focused on specific programs, including mother and child healthcare centers (Bütikofer et al. 2019), mental health centers (Dias and Fontes 2022), and community health interventions (Rocha and Soares 2010), or evaluate the effects of changes in physician supply (Carrillo and Feres 2019; Iizuka and Watanabe 2016). Our study contributes to this literature by focusing on the supply of hospitals and health clinics, primarily in the public sector.

In the context of Turkey, previous studies examined the correlates of infant mortality in early 2000s, documenting that breastfeeding, maternal age at birth, place of delivery, and prenatal care are strongly correlated with infant mortality risk (Seckin and Kirdar 2009). Besides these, other studies found that parental education levels, household economic status, maternal place of childhood residence, and consanguineous marriages are significant risk factors for infant mortality (Yanikkaya and Selim 2010). These studies have also documented that infant mortality is higher in the eastern regions compared to western ones and that it is higher among ethnic Kurds compared to ethnic Turks (Seckin and Kirdar 2009). Building on this literature, we examine whether Islamic rule mitigates the adverse effects of regional and ethnic disparities on infant mortality.

The rest of the paper is organized as follows: Section 2 provides a description of the context and institutional background. Section 3 presents the data used for the analysis, the identification strategy, and preliminary checks for the RD analysis. Section 4 presents the main results, and Section 5 discusses the evidence on potential channels. Section 6 concludes the paper.

2 Context

2.1 Islamic political representation and infant mortality in 1990s

After Turkey's coup in 1980, the military officials that came to power embraced a connection between Islam and the country's political institutions in order to curtail the existing ideological polarization in the country and legitimize their positions of power (Yavuz 1997). The political recognition of Islam enabled new Islamic political parties to be born out of those that had been previously disbanded by the government.

Breaking the political trend of their predecessors, the new Islamic parties adopted an agenda that combined social democracy with Islamic ideology in order to broaden their voter base (Taniyici 2015). The most prominent among these parties was the WP, which subscribed to a form of social democratic populism and adopted tenets of equality, social welfare, and justice (Akinci 1999).

The Islamic parties had limited political success throughout the 1980s, partially due to strict regulation they faced from the military leaders in power (Yavuz 1997). However, by the middle of the 1990s, they gained traction with a broader voter base that included the country's poor working class. The poor working class had lost trust in the established secular parties, and the Islamic parties provided an appealing alternative due to the parties' position as political outsiders advocating for the freedom and welfare of the working class (Akinci 1999; Yavuz 1997). By 1994, the WP garnered more than 19% of all votes nationally and captured over 300 mayoral seats, including Turkey's two largest cities: Istanbul and Ankara. Once in power, Islamic mayors demonstrated a higher prioritization of public service than their secular predecessor and attempted to improve services that were officially outside the policy domain of municipal government, including education and healthcare (Akinci 1999; Kurt et al. 2018; Meyersson 2014).

Healthcare improvements were a particularly relevant social welfare issue since the central government had historically struggled to deliver on their promise for universal access to healthcare. In 1961, after Turkey's first military coup, a new constitution was ratified that outlined citizens' right to health, formally making the state responsible for universal healthcare coverage (Yilmaz 2014). The strategy to implement universal healthcare coverage was comprised of building state-owned hospitals and health centers across the country and establishing universal insurance. However, progress towards universal coverage was slow, due to a lack of financing, poor policy design, and a shortage of medical workers. In particular, the poor and those living in rural areas had the lowest access to healthcare, due to insufficient insurance coverage and insufficient health infrastructure in rural areas (WHO 1996).

The 1996 World Health Organization report, "Health Care Systems in Transition: Turkey," stated that the most important causes of mortality were infectious diseases for infants and infectious diseases and their complications for children aged 1–5 (WHO 1996). The report asserted that a fragmented healthcare delivery system, deficiencies in the number and capacity of health clinics and centers to provide essential services, and the inadequate allocation of financial resources to healthcare were among the primary impediments to effectively reducing infant mortality in Turkey.

Studies that reviewed trends in mother-child health indicators argued that government initiatives aiming to mitigate substantial disparities across different regions—particularly the east–west divide—were important in making progress towards improving child health and prenatal care outcomes (Akin and Köseli 1997). These investments also led to an overall improvement in maternal healthcare utilization throughout 1990s, with the rate of prenatal care utilization increasing from 67% in 1993 to 81% in 2003, and the share of women delivering in healthcare facilities climbed from 64 to 83% over the same period (Santas et al. 2018). At the same time, the infant mortality rate fell from 47 per 1000 live births in 1993 to 25 per 1000 live births in 2003 (World Bank 2024). Related studies documented risk factors associated with

infant mortality, showing that breastfeeding, maternal age at birth, place of delivery, and prenatal care, as well as parental education levels, household economic status, maternal place of childhood residence, and consanguineous marriages, are all significant factors influencing infant mortality risk based on 1998 and 2003 DHS data (Seckin and Kirdar 2009; Yanikkaya and Selim 2010).

2.2 Public health policy of welfare party

Given the Islamic agenda of social welfare, the representatives of the party made public health goals a part of their political platform (Akinci 1999). In fact, one of the primary goals of the 1991 general election declarations of WP was improving health equality and ensuring the citizens' right to healthcare. Some of the promises to achieve this objective included providing assistance to low-income individuals, rewarding healthcare institutions that provide healthcare services to the public, appointing a designated doctor to each citizen, and providing health insurance to every resident. Additionally, the party specifically targeted improving healthcare access for rural and remote areas by proposing to increase the number of local hospitals and health clinics, as well as improving the effectiveness and capacity of services provided by health clinics in villages. Their stance on public health did not change during the 1995 general elections as they continued to emphasize making healthcare more accessible to low-income segments of the population and used a slogan stating the healthcare system will distribute cure, not trouble (Kurt et al. 2018).⁶

There are several potential factors that could enable Islamic mayors to deliver on their promises for healthcare improvements. The primary factor was the potential availability of financial resources to Islamic mayors at the time. After the 1995 general election, the WP had the highest number of seats in the parliament, which could allow municipalities led by WP members access to a greater share of centralized funding (Yavuz 1997). Most local administrations had small budgets and limited policy-making power in regard to local services. Funding and provision of services related to health, education, and other social security was the responsibility of the central government (World Bank 2004). Thus, Islamic representation in central government raised the advocacy and funding towards major investments in public health provisions within municipalities with Islamic mayors. Additionally, even when centralized funds were not available, Islamic parties had historically borrowed extensively to fill gaps in funds (Yilmaz 2014). Moreover, the utilization of religious networks enabled Islamic parties to build connections with a newly emerging Islamic bourgeoisie, who provided a key source of funding for social aid projects. The combination of these factors was critical for the Islamic parties to be more active in the provision of health infrastructure and services at the municipal level compared to secular parties.

Consequently, the Turkish government's healthcare spending per capita exhibited a substantial increase during the time in which Islamic parties were leading a coalition government. The OECD data shows that there was an increase in the per capita government public health spending from \$122 in 1992 to \$160 in 1996, \$191 in 1997,

⁶ General elections are held every 4 years, while local elections are held every 5 years. General election declarations are consistent and represent party preferences.

and \$216 in 1998 (OECD 2024). Panel I of Appendix Figure B.1 shows that the health budget of the government and the percentage of health spending as a share of the GDP have grown steadily from 1995 to 2000. This trend is particularly prevalent in expenditure on employees as seen in Panel II of Appendix Figure B.1. These improvements were also accompanied by an increase in the number of child vaccinations, and as seen in Appendix Figure B.2, the number of health clinics (*sağlık ocağı*) and health centers (*sağlık evi*)—particularly those that were permanent—also rose substantially during this period (Kurt et al. 2018).

3 Data and empirical strategy

3.1 Data

We combine two types of data in our empirical analysis: (i) municipality-level data on elections, healthcare infrastructure, and child mortality rates; (ii) individual-level data on infant mortality, birth outcomes, place of delivery, healthcare treatments, and vaccinations.

3.1.1 Municipality-level data

The information on municipal mayoral elections come from the Turkish Statistical Institute, which provides the number of votes received by each party in a given municipality for each election. In the 1994 local elections, a total of 2710 municipalities held an election, with 14 parties receiving votes. The WP and the Great Union Party—the two Islamic parties—won 340 mayoral seats and gained approximately 20% of national votes.⁷ Using this data, we define the Islamic mayor treatment as a dummy equal to one if an Islamic party received more votes than any other party within a municipality.

We use the 2001 Building Census collected by the Turkish Statistical Institute to obtain information on completed healthcare buildings since supply of healthcare buildings may be a potential channel through which Islamic mayors influence child health. The data provides two measures of healthcare buildings at the municipality level: (i) the number of hospitals and health clinics and (ii) the area of hospital and health clinic buildings. Our main outcome variables are measured from 1990 to 2000, and in placebo checks, we also use these indicators measured from 1980 to 1990.⁸ The Building Census also provides information on ownership, which allows us to distinguish between hospitals and health clinics owned by private agents and those owned by the public institutions.⁹

⁷ Note that the Great Union Party (or, *Büyük Birlik Partisi* in Turkish) is a fringe party that represents both Islamic and far-right nationalistic elements. It won 0.94% of the national vote share and had only 11 mayoral seats at the municipality level.

⁸ We note that the building census is only available for the years 1990 and 2000, and it is unavailable for any single years in between this time period. Hence, we examine the effects of Islamic rule on municipal healthcare infrastructure using the infrastructure variables measured from 1990 to 2000, and we also examine the effects for the pre-shock period from 1980 to 1990 as a placebo test.

⁹ Note that we add the buildings with public, private, and unknown ownerships to obtain the total number and area of buildings.

Finally, we use the 1990 and 2000 Population Census to obtain municipality-level data on child mortality rates, population by age groups, gender, and population change estimates. More specifically, the census asks all women above the age of 15 the number births they have had and the number of living children up to the point of the interview. Using this information, we divide the number of deceased children to the number of births and create a measure of child mortality rate.¹⁰ Appendix A provides more information on definitions of variables used in our analysis.

Some municipalities changed their names over time. Since there is no internal code through which each data set refers to municipalities and no publicly available file that tracks name or area changes of municipalities exist, many municipalities are tracked through the Turkish Municipal Code changes and address information from Google Maps to maximize the number of matches.¹¹

Panel A of Appendix Table B.1 provides summary statistics within the optimal bandwidth of 0.18. We observe that in this subset of municipalities, 34% of municipalities had an Islamic mayor, and the average Islamic vote share was 31%. The average number of parties receiving votes in a municipality was 6. We also observe an overall drop in child mortality from 10% in 1990 to 5% in 2000.

3.1.2 Individual-level data

We use the 2003 Demographic and Health Survey (DHS) for information on child and infant health, including mortality rates, birth outcomes, healthcare treatments, and vaccination outcomes. We limit the sample to all children born on or after 1994 (the election year) and match the 2003 DHS with the election data using the respondent's province, district, and municipality codes with the corresponding codes in the 2000 Population Census. This provides a direct comparison of infant outcomes in municipalities where an Islamic major barely won to those where an Islamic major barely lost the election. Appendix A includes definitions of all variables used in the analysis.

Panel B of Appendix Table B.1 provides summary statistics within the optimal bandwidth of 0.18. The top panel presents summary statistics for the sample of women in our analysis. We observe that the average age of women is 34 and 91% of them have a child. Approximately 64% completed some formal schooling up to and including middle school, and 19% received at least a high school education. The average infant mortality is 2.5%, with 1.5% neonatal mortality and 1% postneonatal mortality.¹² The dataset has also detailed information on mother's age, mother tongue, the number of children the woman has, whether she has had a stillbirth before, and whether she moved in the last 10 years.

The middle and bottom panels display summary statistics for the panel of births and for the panel of living children, both constructed at the child level. The bottom

¹⁰ According to the 2003 DHS data, 83% of all child deaths take place between the ages of 0 and 1, or are infant deaths, in Turkey.

¹¹ Approximately 10% municipalities do not exactly match other municipalities over time. These municipalities are matched by checking for changes and errors in spelling, tracking name changes through news and official sources, and Google maps location matches with other unmatched municipalities.

¹² Neonatal mortality is the mortality rate among children less than 1 month old. Postneonatal mortality is the mortality rate among children aged 1 month to 1 year.

panel shows that approximately 19% of child births occurred at home, and 18% at a private hospital or health clinic, with the remaining births taking place at a public institution. We also observe that children receive about 7.8 vaccines on average, and 88% were treated for a cough or a fever. The dataset also provides detailed information on prenatal care outcomes, demographic outcomes for the children including their age and gender, and their vaccination rates for specific vaccines.

3.2 Identification

The empirical challenge in estimating the effects of local Islamic rule on infant mortality outcomes and healthcare investments is the non-random assignment of mayor types across locations. The municipalities where Islamic mayors receive a higher vote share could be the ones with greater constraints in investing in local healthcare infrastructure, and they may be more likely to experience worse outcomes for infant health. The estimates that do not account for omitted variable bias are likely to produce biased estimates.

Our goal in this study is to compare municipalities that are effectively randomly assigned to Islamic politicians. To this end, our empirical strategy is to use a regression discontinuity (RD) design by exploiting close elections between secular and Islamic candidates. Using the discontinuity in the electoral win margin within a narrow bandwidth of close elections, we estimate the causal effects of an elected Islamic mayor on infant mortality outcomes and healthcare investments.

More specifically, the RD design exploits discontinuity in the treatment to identify causal effects. The treatment, t_i , is determined by the cutoff score, c , on the forcing variable x_i . Following Meyerson (2014), we calculate the forcing variable, the Islamic win margin, by subtracting the share of votes received by the secular party with the highest number of votes from the share of votes received by the Islamic party with the highest number of votes. Since these shares each vary between 0 and 1, the Islamic win margin varies between -1 and 1 and the cutoff is therefore $c = 0$. Municipalities that fall below the cutoff, ($t_i = 0$), receive a secular mayor, while municipalities above the cutoff, ($t_i = 1$), receive an Islamic mayor.

Our specification follows a basic RD form:

$$y_i = \alpha + \beta t_i + f(x_i) + \epsilon_i, \quad \forall x_i \in (c - h, c + h) \quad (1)$$

where y_i is the outcome of interest, which is regressed on a treatment indicator t_i that equals one for municipalities that elected an Islamic mayor and zero otherwise. x_i is the forcing variable defined as the Islamic win margin, or the win margin for the Islamic party relative to the largest non-Islamic party. The control function, $f()$, is a continuous local linear function fit separately on each side of the threshold point c . The standard errors are clustered at the province level. We additionally control for the following municipality characteristics: the Islamic vote share, the total number of parties receiving votes, the number of registered voters as a proxy for population, the male-to-female population ratio, an indicator for whether the incumbent is from an Islamic party, and indicator variables for whether the municipality is a sub-metro (büyükşehir

in Turkish), province or district center, and province fixed effects.¹³ Moreover, in mother-level specifications using the DHS data, we control for age of the mother, its square, and indicator variables for whether the mother does not have Turkish as a mother tongue and whether the grandmother had no formal education. Finally, in living children panel specifications, we include the same controls as the mother-level regressions with the addition of age of the child, its square, and the sex of the child. For the regression sample restriction, we use the Calonico et al. (2014) procedure to choose the optimal bandwidth h .¹⁴ As discussed in Section 4, our results are robust to a range of bandwidths and a quadratic control function.¹⁵

The optimal bandwidth according to the default Calonico et al. (2014) algorithm (using one common MSE-optimal bandwidth selector for the RD treatment effect estimator, *mserd*) is 0.18 for the infant mortality outcome. For brevity, we will use the RD estimates for this optimal bandwidth in interpreting the magnitudes of the results. For robustness, we also present our results using full range of optimal bandwidths from 0.14 to 0.20 selected by the Calonico et al. (2014) algorithm.¹⁶ The results are highly similar with different bandwidths and control functions.

After estimating average treatment effects, we will also explore heterogeneity by mother's age and education levels. One hypothesis we are interested in testing is whether any investments that Islamic mayors undertake benefit more disadvantaged populations. We will proxy disadvantaged mothers by those who do not have any formal education.

3.3 Preliminary checks

We present two standard validity checks for the RD design (Imbens and Lemieux 2008). First, we examine whether the density of the forcing variable, Islamic win margin, is continuous at the discontinuity to ensure there is no manipulation around the cutoff. Such a manipulation would lead to non-quasi-random selection around the cutoff and invalidate the regression discontinuity design. We perform a McCrary density test on the density of the forcing variable. This yields an insignificant estimate, as shown in Appendix Figure B.3. A formal test provided in McCrary (2008) also fails to reject the null hypothesis.¹⁷

Second, we check whether the predetermined covariates are balanced around the discontinuity. In Fig. 1, each graph plots local averages of the outcome in approximately 4% bins against the forcing variable. We find no evidence of a significant break at the discontinuity for Islamic vote share, number of registered voters (in logs), indicators for municipality type, number of parties receiving votes, male-to-female

¹³ The Islamic vote share is the sum of the shares of votes received by the WP and the Great Union Party at the municipality level.

¹⁴ We use a uniform kernel in our estimations. The results are very similar when we use a triangular kernel.

¹⁵ Estimating results with higher order control functions may lead to misleading results (Gelman and Imbens 2019).

¹⁶ The optimal bandwidth according to Imbens and Kalyanaraman (2012) method also falls within this range, with an optimal bandwidth of 0.15.

¹⁷ To conduct the test, we use the optimal bandwidth of 0.18. The test yields a p -value of 0.9.

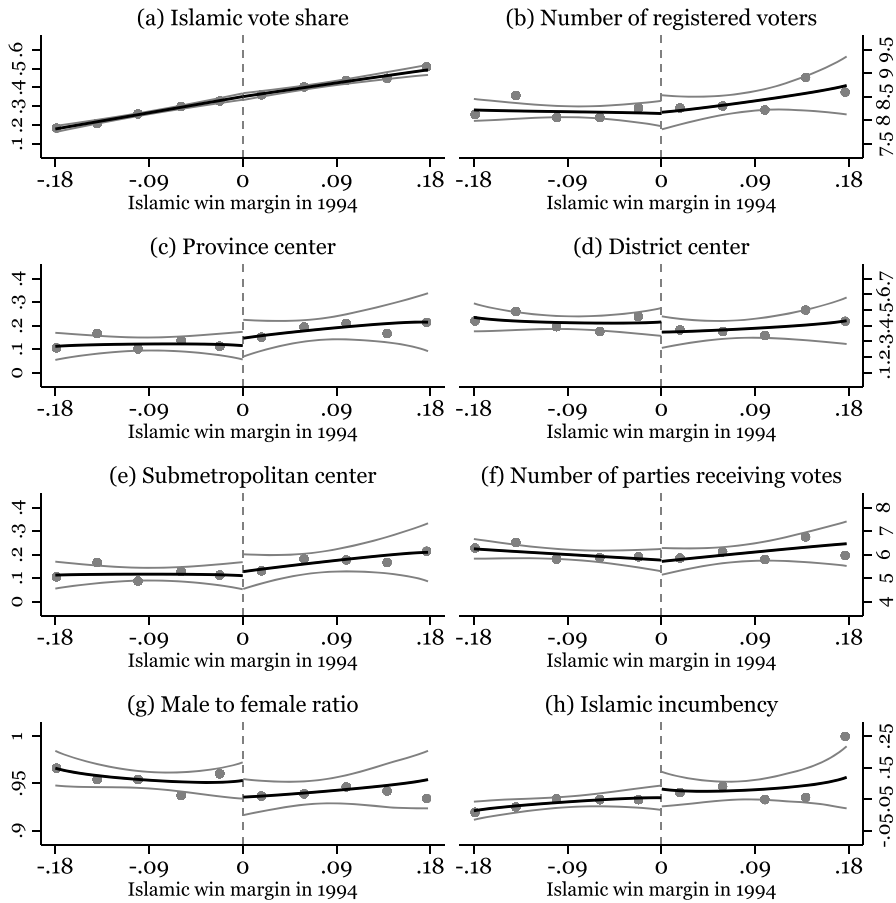


Fig. 1 Balanced municipality covariates. Notes: 95% confidence intervals are shown for two non-parametric regressions on each side of the cutoff. The optimal bandwidth of 0.18 is used. Sources: 1994 Turkish local election results and 2000 Turkish population census, TurkSTAT

population ratio, or Islamic incumbency indicator.¹⁸ In Appendix Figure B.4, we plot local averages of the residualized covariates for mother and child-level regressions in the DHS data.¹⁹ We control for all of these variables with the exception of indicators for whether the mother completed primary school and whether she completed middle school in our baseline estimations since a previous study has shown that local Islamic rule increased the high school completion of 15–20 year-old women (Meyersson 2014). However, as can be seen in Appendix Figure B.4, the formal school

¹⁸ In regression-based tests reported in Panel A of Appendix Table B.2, we note that none of the predetermined covariates display any evidence of a statistically significant jump at the discontinuity. SUR test of the coefficients' joint significance results in a p -value of 0.73.

¹⁹ We residualize these variables by regressing them on province fixed effects. The unresidualized figure shows very similar results.

completion probability up to the middle school level and high school completion probability are balanced around the cutoff for our sample since we have women of all ages from 15 to 49.²⁰ Moreover, checking other figures for covariate balance in Appendix Figure B.4 and considering regression-based tests reported in Panel B of Appendix Table B.2, we note that none of the predetermined covariates display evidence of a statistically significant jump at the discontinuity, with the only exception being the indicator for child gender. SUR test of the coefficients' joint significance results in a p -value of 0.20. This evidence further supports the RD identifying assumption that municipalities that were barely won by the Islamic parties are not significantly different in terms of their size, religious preferences, or centrality compared to other municipalities at the discontinuity. Finally, using the 1990 population census, we test whether there are significant differences in the pre-election outcomes. Specifically, results reported in Appendix Table B.3 show no evidence of a significant difference in high school completion rates of boys and girls around the discontinuity.

Moreover, recent studies have shown that politician characteristic RD designs capture the effect of the politician characteristics and all compensating differentials at the discontinuity (Marshall 2022). For instance, in close secular-Islamic elections, Islamic candidates may be more competent than their secular counterparts if voters hold biases against Islamic politicians, and in that scenario, competence would serve as a compensating differential against such bias. To test whether such compensating differentials exist for Islamic candidates, we test whether the level of education or age differ for Islamic politicians compared to secular ones in close elections. The results reported in Appendix Tables B.4 and B.5 indicate no evidence of a significant change in the education level or age of the politician around the discontinuity, implying that compensating differentials for Islamic rule in these local elections may not have been large in this setting.

4 Islamic rule and infant mortality

We begin by testing the effects of local Islamic rule on infant mortality. In treated municipalities, investments in public healthcare may improve the quality and access of public health services and thus reduce infant mortality.

Figure 2 provides a visual illustration of the RD treatment effects on infant and neonatal mortality using the 2003 DHS. The figures show a downward shift at the discontinuity in both infant and neonatal mortality for children born after 1994.²¹ These findings are supported by Appendix Figure B.5, which shows that the child mortality rate reported in 2000 decreased around the discontinuity. However, prior to the assignment of an Islamic mayor in 1994, there is no evidence of a significant change at the cutoff point in child mortality rate reported in 1990. Moreover, Appendix Figure B.6 shows no evidence of a significant change in the infant, neonatal, and postneonatal mortality of children born before 1994, i.e., those born prior to the local elections we examine, around the discontinuity.

²⁰ We show in Section 4 that including maternal education indicators as controls makes no difference to our results. However, we leave them out in baseline regressions due to them being potentially endogenous.

²¹ In contrast, Fig. 2(c) shows no significant change at the cutoff in postneonatal mortality.

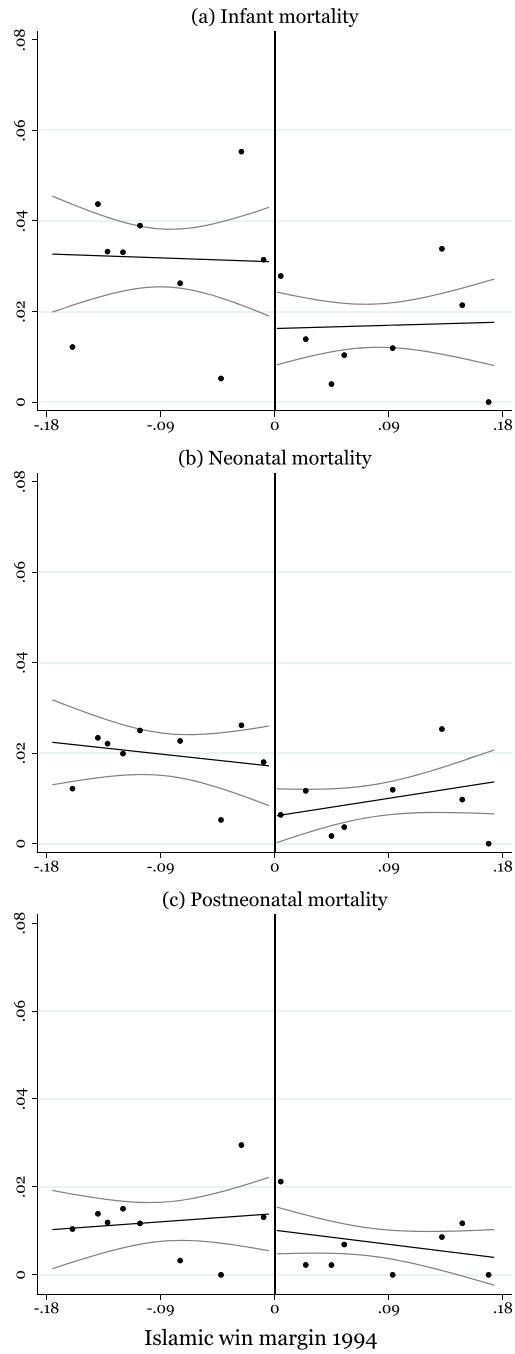


Fig. 2 Islamic rule and infant mortality. Notes: 95% confidence intervals are shown for two linear regressions on each side of the cutoff. The optimal bandwidth of 0.18 is used. Sources: 1994 Turkish local election results, TurkSTAT, 2003 Demographic and Health survey

One may be concerned that control municipalities may have been negatively affected from a potential shift of funding towards treated municipalities, leading to worse child health outcomes in control municipalities. In Appendix Figure B.5, we observe that average child mortality significantly fell even in control municipalities, declining from 1990 to 2000 (left side the two panels in Figure B.6). However, at the point of discontinuity, we observe a larger decline in child mortality for treated municipalities. Given these patterns, it would be inconsistent to conclude that the effects we document in this study are driven by worsening in child health outcomes in control municipalities.

For a more refined analysis, panel A of Table 1 presents infant mortality regression results with the full set of controls across different bandwidths. The RD estimates in the first row of panel A indicate a 2.1 percentage point decline in infant mortality rate at the optimal bandwidth of .18, which is a sizable impact compared to the control group mean of 3.2%. Point estimates are similar across bandwidths. Panels B and C show that the decline in infant mortality is primarily driven by neonatal mortality instead of postneonatal mortality as neonatal mortality displays a more significant and greater magnitude decrease across all bandwidths compared to postneonatal mortality.²² In addition, we observe that the coefficient estimate in column 3 suggests a (imprecisely estimated) decline of 0.2 percentage points in postneonatal mortality, which constitutes approximately 10% of the decline in total infant mortality in affected municipalities.²³ The evidence of larger improvements in neonatal mortality compared to postneonatal mortality could be driven by improvements in delivery conditions and early life healthcare provisions, which we explore in Section 5.

We show that these results on infant mortality are not driven by younger mothers who might have completed high school in municipalities with an Islamic mayor (Meyersson 2014).²⁴ First, as shown in Appendix Figure B.4 and Appendix Table B.2, there is no evidence of a significant change in the probability of mothers completing high school. Controlling for these maternal education indicators also makes no significant difference to the results as shown in Appendix Table B.7.

Second, when we examine heterogeneous treatment effects by mother's age or education, the RD estimates in Table 2 show that there is no significant difference between younger or older mothers (panel A), and the effects are not driven by mothers that completed high school (panel B). In fact, the estimated effect sizes are larger for mothers who have not had any formal schooling.²⁵ More specifically, we find an RD treatment effect of 5.3 percentage points decline in infant mortality for mothers with no formal schooling experience, with 2.3 percentage points accounted by neonatal mortality and

²² Estimates for infant mortality and neonatal mortality are robust to using a quadratic control function as shown in Appendix Table B.6.

²³ We calculate the relative importance of the decline in postneonatal mortality in total infant mortality as follows: $0.002/0.021 \times 100 = 10$. However, these treatment effects should be interpreted with caution since none of these estimates are statistically significant at conventional levels.

²⁴ We examine the age heterogeneity by splitting the sample at age 25 since the average age of the mother at birth is 25 within the optimal bandwidth. The *p*-values showing the difference in estimates between sub-panel I and II in panel A range from 0.8 to 0.7, indicating no statistically significant difference between these estimates.

²⁵ These differences can also be observed through formal tests reported at the bottom of the panel.

Table 1 Islamic rule and infant mortality

	± 0.14	± 0.16	± 0.18	± 0.20
Panel A: Infant mortality				
Islamic mayor in 1994	-0.025*** (0.007)	-0.025*** (0.006)	-0.021*** (0.007)	-0.019** (0.008)
Control group mean	0.032	0.033	0.032	0.033
Observations	1979	2239	2357	2646
Panel B: Neonatal mortality				
Islamic mayor in 1994	-0.023*** (0.006)	-0.022*** (0.007)	-0.019*** (0.006)	-0.016** (0.006)
Control group mean	0.020	0.020	0.020	0.021
Observations	1979	2239	2357	2646
Panel C: Postneonatal mortality				
Islamic mayor in 1994	-0.001 (0.006)	-0.003 (0.006)	-0.002 (0.006)	-0.003 (0.004)
Control group mean	0.012	0.012	0.012	0.011
Observations	1979	2239	2357	2646

Notes: This table reports the discontinuity estimates of the regression discontinuity involving infant mortality, neonatal mortality, and postneonatal mortality as the dependent variables and the Islamic party win margin, the Islamic mayor dummy (both from the 1994 elections), and their interaction as the independent variables. Only the Islamic mayor coefficients are reported. Each row displays the coefficient estimates with different dependent variables, whereas each column displays a different bandwidth. Uniform kernel weights are used. All individuals residing within the municipalities where the Islamic party win margin is within the given bandwidth are taken as observations. Controls include the Islamic vote share, the number of parties receiving votes, and the log number of registered voters in the 1994 elections, sub-metro center, province center and district center dummies, the male-to-female ratio from the 2000 population census, an Islamic party incumbent dummy, province dummies, age of the mother, its square, and dummies that indicate that the mother does not have Turkish as a mother tongue and the grandmother had no formal education. RD coefficients are reported. Robust standard errors are in parentheses, clustered at the province level. The p -values are calculated using these errors. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Sources: 1994 Turkish local election results and 2000 Turkish Population Census, TurkSTAT, 2003 Demographic and Health survey

3 percentage points by postneonatal mortality. These findings are consistent with the idea that public and affordable healthcare is critical for disadvantaged groups, who benefit more from these healthcare investments.

In Appendix Table B.8, we examine whether there are any RD treatment effects on birth outcomes in response to having an Islamic mayor. We find no evidence of a significant impact on the probability of having children or the number of children women have on average in the affected municipalities. These findings rule out fertility changes as a potential mechanism to explain our results. Moreover, we find no evidence of a significant RD treatment effect on having any stillbirths.

As an additional robustness check, we test whether our results are driven by large cities which may have implemented other changes in this time period. In Appendix Tables B.9, B.10, and B.11, we replicated our results by excluding Istanbul, Ankara, and Izmir, the three largest cities in Turkey with the first two being cities where Islamic mayors were barely elected in the 1994 local elections. We observe that our results are robust to the exclusion of these large cities from our sample.

Table 2 Islamic rule and infant mortality on the mother level by mother's age and education

	Infant mortality	Neonatal mortality	Postneonatal mortality
Panel A: Mother's age			
<i>I. 25 years old or younger</i>			
Islamic mayor in 1994	−0.027* (0.016)	−0.020** (0.009)	−0.006 (0.011)
Control group mean	0.034	0.018	0.015
Observations	580	580	580
<i>II. Older than 25 years old</i>			
Islamic mayor in 1994	−0.023** (0.009)	−0.022*** (0.007)	−0.001 (0.008)
Control group mean	0.032	0.021	0.011
Observations	1777	1777	1777
Sub-panel I = Sub-panel II	0.825	0.829	0.696
Panel B: Mother's education			
<i>I. Has not had any schooling</i>			
Islamic mayor in 1994	−0.053** (0.020)	−0.023 (0.021)	−0.030* (0.017)
Control group mean	0.068	0.046	0.023
Observations	392	392	392
<i>II. Finished schooling up to middle school</i>			
Islamic mayor in 1994	−0.011 (0.011)	−0.015* (0.009)	0.004 (0.007)
Control group mean	0.028	0.015	0.012
Observations	1532	1532	1532
<i>III. Finished high school or above</i>			
Islamic mayor in 1994	−0.022* (0.011)	−0.027** (0.012)	0.005 (0.009)
Control group mean	0.019	0.015	0.004
Observations	433	433	433
Sub-panel I = Sub-panel II	0.037	0.594	0.024
Sub-panel I = Sub-panel III	0.146	0.872	0.059
Sub-panel II = Sub-panel III	0.497	0.891	0.495

Notes: This table reports the discontinuity estimates of the regression discontinuity involving infant, neonatal, and postneonatal mortality as the dependent variables and the Islamic party win margin, the Islamic mayor dummy (both from the 1994 elections), and their interaction as the independent variables. Only the Islamic mayor coefficients are reported. Individual weights in DHS are used, along with uniform kernel weights. All individuals who are residing within the municipalities where the Islamic party win margin is between −0.18 and 0.18 are taken as observations. For infant mortality, only children born in 1994 or later are taken as observations. Controls are the same as Table 1. Robust standard errors are in parentheses, clustered at the province level. The *p*-values are calculated using these errors. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Sources: 1994 Turkish local election results and 2000 Turkish Population Census, TurkSTAT, 2003 Demographic and Health survey

5 Potential channels

In this section, we explore the potential channels through which Islamic mayors may reduce the incidence of infant mortality focusing on the following: (i) the supply of healthcare facilities in municipalities, (ii) the place of delivery, health-seeking behaviors, and prenatal care, and (iii) regional differences in poverty or religiosity, and selective migration.

5.1 Supply of healthcare facilities

We test the effects of local Islamic rule on the number and size of healthcare facilities. If treated municipalities have more or larger healthcare facilities, the access to public healthcare services may significantly improve. In addition, larger healthcare facilities may be able to accommodate a higher number of patients, provide higher quality healthcare treatments, and house a larger supply of healthcare professionals. In terms of child health, the probability of mortality is highest at or directly after birth, making healthcare provision during delivery of the baby and postdelivery care extremely critical for the survival of infants. Previous studies using close female-male elections show that female politicians invest more in village-level healthcare facilities, which leads to a larger reduction in infant mortality in affected districts of India (Bhalotra and Clots-Figueras 2014). In this section, we explore whether there are similar treatment effects on healthcare facilities resulting from marginally electing an Islamic local politician. Table 3 presents regression results for the number of hospitals and clinics in panel A and the area (in m^2) of hospitals and clinics in panel B, built between 1990 and 2000. The RD estimates in the first row of panel A reveal a 0.2 log point treatment effect on the total number of hospitals and clinics. The estimates are robust to different bandwidths and roughly correspond to a 26% increase in supply of healthcare facilities relative to the control group mean using the optimal bandwidth of 0.18. Comparing the RD estimates in the second and third rows of panel A, we observe that these RD treatment effects are driven by the increase in the number of public hospitals and clinics, with no evidence of a significant change in the number of private hospitals and clinics.²⁶

The RD estimates in panel B of Table 3 also show significant treatment effects on the total area of hospitals and clinics built between 1990 and 2000 (first row estimates). In terms of magnitude, the RD estimate for the same 0.18 bandwidth reveals a treatment effect of 0.8 log point increase, corresponding to a 24% increase relative to the control group mean. Examining the RD estimates in the second and third rows of panel B, there is a significant and positive treatment effect on the area of public healthcare

²⁶ Note that the total coefficient estimate of public and private health regressions does not add up to the total coefficient estimates due to the added “unknown” category in the total building counts and the log scale transformation of these variables.

Table 3 Islamic rule and healthcare facilities built between 1990 and 2000

	± 0.14	± 0.16	± 0.18	± 0.20
Panel A: Number of hospitals and clinics (in log scale)				
<i>I. Total</i>				
Islamic mayor in 1994	0.225*** (0.077)	0.209*** (0.075)	0.175** (0.071)	0.134** (0.064)
Control group mean	0.676	0.682	0.672	0.681
Observations	628	692	757	823
<i>II. Public</i>				
Islamic mayor in 1994	0.212*** (0.068)	0.196*** (0.065)	0.173*** (0.065)	0.150** (0.060)
Control group mean	0.518	0.531	0.523	0.535
Observations	628	692	757	823
<i>III. Private</i>				
Islamic mayor in 1994	0.090 (0.062)	0.077 (0.061)	0.056 (0.052)	0.007 (0.049)
Control group mean	0.306	0.296	0.284	0.285
Observations	628	692	757	823
Panel B: Area of hospitals and clinics (in log scale)				
<i>I. Total</i>				
Islamic mayor in 1994	1.006** (0.449)	0.988** (0.433)	0.817* (0.442)	0.763* (0.396)
Control group mean	3.397	3.419	3.423	3.482
Observations	628	692	757	823
<i>II. Public</i>				
Islamic mayor in 1994	1.064*** (0.383)	0.983*** (0.365)	0.776** (0.373)	0.735** (0.349)
Control group mean	3.030	3.077	3.068	3.137
Observations	628	692	757	823
<i>III. Private</i>				
Islamic mayor in 1994	0.528* (0.299)	0.543* (0.316)	0.435 (0.285)	0.251 (0.272)
Control group mean	1.288	1.298	1.260	1.260
Observations	628	692	757	823

Notes: This table reports the discontinuity estimates of the regression discontinuity involving the log number or the log area of public hospitals and clinics built between 1990 and 2000 as the dependent variables and the Islamic party win margin, the Islamic mayor dummy (both from the 1994 elections), and their interaction as the independent variables. The Islamic mayor coefficients are reported. Each row displays the coefficient estimates with different dependent variables, whereas each column displays a different bandwidth. Uniform kernel weights are used. All municipalities within the given bandwidth of the Islamic party win margin are taken as observations. Controls include the Islamic vote share, the number of parties receiving votes, and the log number of registered voters in the 1994 elections, sub-metro center, province center and district center dummies, the male-to-female ratio from the 2000 population census, an Islamic party incumbent dummy, and province dummies. RD coefficients are reported. Robust standard errors are in parentheses, clustered at the province level. The p -values are calculated using these errors. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Sources: 1994 Turkish local election results, 2001 Turkish Building Census, and 2000 Turkish Population Census, TurkSTAT

facilities, while the treatment effects are smaller and less precisely estimated for the area of private healthcare facilities.^{27,28}

Overall, we conclude from this evidence that the election of an Islamic mayor significantly increased the availability and the coverage area of healthcare facilities in the municipalities where they were barely elected and that these increases were mostly driven by public investments in these facilities.²⁹ We interpret these results as evidence of improved access to healthcare as a potential channel of the impacts of Islamic mayors on child health. Furthermore, improved access to healthcare centers, as a potential mechanism, supports the findings of a larger decrease in neonatal mortality relative to postneonatal mortality since access to hospitals and healthcare provision is shown to have the greatest impact on infant mortality within the first 24 h of birth (Ravelli et al. 2011).

5.2 Place of delivery, health-seeking behaviors, and prenatal care

We next examine whether exposure to an Islamic mayor influences the place of delivery, health-seeking behaviors such as vaccinations, and prenatal care outcomes. Using the 2003 DHS birth panel, panel A of Table 4 shows a significant, positive RD treatment effect of 7.0 percentage points on the probability of a child being given birth in a government facility and a negative RD treatment effect of 6.9 percentage points on the probability of a child being given birth in a private facility, while there is no significant change in the probability of home delivery. These findings suggest that parents potentially substituted away from private healthcare providers to public ones as the supply of newly available and more affordable public hospitals increased in their municipalities, as shown in Table 3. In addition, we further explore whether these effects vary by maternal education level. Results presented in Appendix Table B.13 show a decline in home delivery and an increase in delivery at government institutions for women who did not have any formal schooling, and while the coefficient magnitudes are large, we lack sufficient sample size to estimate these effects precisely. Nevertheless, these findings are indicative of potential declines in home deliveries for the least educated women in the treated municipalities and their shift towards giving birth in public hospitals in affected locations.³⁰

Panel B of Table 4 shows a significant and positive RD treatment impact of 17 percentage points on the probability of a child being treated for a cough or a fever, which corresponds to a 19% increase relative to the control group mean. In addition,

²⁷ We note that while the treatment effects are larger and significant at smaller bandwidths, at larger bandwidths, the effects are not statistically significant and smaller.

²⁸ These estimates are similar when a quadratic control function is used as shown in Appendix Table B.6.

²⁹ Using the placebo period of 1980–1990, there is no evidence that electing an Islamic mayor in 1994 has a significant impact on the number or size of healthcare facilities prior to 1994, as shown in Appendix Table B.12.

³⁰ Note that the formal tests of differences between subgroups indicate that we fail to reject that most effects are equal to each other, with the only exception being home delivery outcome for women who did not have formal schooling and those who finished schooling up to middle school.

Table 4 Potential channels

Panel A: Place of delivery		At home	At government institution	At private institution				
Islamic mayor in 1994		−0.001 (0.051)	0.070* (0.041)	−0.069* (0.036)				
Control group mean		0.170	0.660	0.170				
Observations		1899	1899	1899				
Panel B: Health-seeking behaviors		Cough or fever treated	Number of vaccines	Hepatitis B completed	DPT completed	Polio completed	BCG completed	Measles completed
Islamic mayor in 1994		0.169*** (0.030)	0.856* (0.484)	0.095* (0.053)	0.126* (0.071)	0.096* (0.055)	−0.011 (0.023)	0.032 (0.025)
Control group mean		0.886	7.913	0.526	0.657	0.710	0.881	0.740
Observations		1180	1897	1646	1681	1731	1877	1842
Panel C: Prenatal care behavior		Number of visits to receive antenatal care	Ultrasound during pregnancy	Received vitamins during pregnancy	Received iron or folic acid during pregnancy			
Islamic mayor in 1994		0.811** (0.404)	0.005 (0.030)	−0.010 (0.056)	−0.033 (0.052)			
Control group mean		6.196	0.893	0.799	0.789			

Table 4 continued

Observations	1542	1559	1556	1554
<p><i>Notes:</i> This table reports the discontinuity estimates of the regression discontinuity involving home, public and private child delivery, dummy indicating the cough/fever of the child was treated, number of vaccines administered, the full vaccination status of a child in terms of hepatitis, diphtheria, pertussis and tetanus, polio, measles and tuberculosis, the number of visits to receive antenatal care and dummy variables indicating whether a mother had an ultrasound, received vitamins, and received iron or folic acid supplements during pregnancy as the dependent variables and the Islamic party win margin, the Islamic mayor dummy (both from the 1994 elections), and their interaction as the independent variables. Only the Islamic mayor coefficients are reported. Individual weights in DHS are used, along with uniform kernel weights. All children who are residing within the municipalities where the Islamic party win margin is between -0.18 and 0.18 are taken as observations. For infant mortality, only children born in 1994 or later are taken as observations. Controls include the Islamic vote share, the number of parties receiving votes, and the log number of registered voters in the 1994 elections, sub-metro center, province center and district center dummies, the male-to-female ratio from the 2000 population census, an Islamic party incumbent dummy, province dummies, age of the mother, its square, dummies that indicate that the mother does not have Turkish as a mother tongue and the grandmother had no formal education, age of the child, its square, and sex of the child. RD coefficients are reported. Robust standard errors are in parentheses, clustered at the province level. The p-values are calculated using these errors. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$</p> <p><i>Sources:</i> 1994 Turkish local election results and 2000 Turkish Population Census, TurkSTAT, 2003 Demographic and Health survey</p>				

we find a significant increase of in the number of vaccines a child receives as well as an increase in the probability of being fully vaccinated for specific diseases, including hepatitis B, DPT, and polio. These findings suggest that the increased access to healthcare services in municipalities with Islamic mayors improved parents' ability to provide their children with curative treatments as well as preventative treatments such as vaccines that require multiple shots.³¹ We interpret these results as evidence of public deliveries, curative treatments, and childhood vaccinations as additional potential channels for the estimated impacts of local Islamic rule on child health.

Panel C of Table 4 further examines prenatal health-seeking behaviors that may impact early life mortality. The estimate in first column shows a positive and significant RD treatment effect of 0.8 antenatal care visits or a 13% increase relative to the control group mean, implying an improvement in the intensive margin of maternal prenatal care behavior.³² At the same time, for the extensive margin outcomes, we find no significant impact of local Islamic rule on mothers' probability of doing an ultrasound check during pregnancy, receiving vitamins during pregnancy, or receiving iron or folic acid during pregnancy. Since a high fraction of mothers were already engaged in these behaviors even in the absence of Islamic rule, it makes intuitive sense that we do not observe changes in these extensive margin outcomes. We conclude that improvements in the frequency of antenatal care visits could be another channel that can account for the improvements in child health in treated municipalities.

5.3 Other potential channels

As an additional potential channel, we explore whether the RD treatment effects are heterogeneous by level of poverty or religiosity at the municipality level. Specifically, we test the hypothesis that Islamic mayors may be more likely to invest in health infrastructure in locations that are more aligned with their rhetoric of poor and pious populations suffering from lack of investments under secular rule. Following Meyerson (2014), we use the municipal literacy rate in 2000 as a proxy for poverty and the Islamic vote share in 1994 elections as a proxy for religiosity at the municipality level.³³ Appendix Table B.16 reports results by dividing the sample at the median of these indicators. The RD estimates are quite close between these samples, and the differences are largely not statistically significant.³⁴ Thus, we conclude that municipal differences in poverty or religiosity are not driving our results.

Moreover, we test whether the RD treatment effect on infant mortality is larger in municipalities that experienced a large increase in the supply of hospitals and health clinics. In Appendix Table B.17, we examine whether there are heterogeneous RD treatment effects by the change in healthcare facility supply from 1980–1990 period

³¹ Appendix Table B.14 explores heterogeneity in these treatment effects by maternal education. We see positive estimates for most of the outcomes across educational groups and fail to reject that these estimates are equal to each other for the majority of the tests between subgroup estimates.

³² Appendix Table B.15 shows that these improvements in prenatal care intensity are observed for less educated mothers who did not complete high school education.

³³ These variables display no jumps at the discontinuity.

³⁴ Out of 8 tests of subsample coefficient equality, all fail to reject the null that coefficient estimates are equal with the exception of the estimates for infant mortality by median literacy rate.

to 1990–2000 period. The RD estimates in columns 1 and 2 show that the decline in infant mortality is larger in municipalities where the change in the number of hospitals and health clinics was above the median. Similarly, the RD estimates in columns 3 and 4 indicate that the decline in infant mortality is larger in municipalities with an increase in the area of hospitals and health clinics above the median.

Furthermore, we examine whether Islamic rule mitigates the adverse effects of regional and ethnic disparities on infant mortality. Prior studies found that infant mortality is higher in the eastern regions compared to western ones and that it is higher among ethnic Kurds compared to ethnic Turks (Seckin and Kirdar 2009). Specifically, Appendix Table B.18 provides results from an interacted model, allowing us to see whether the Eastern regions and ethnic Kurds experience a higher risk of infant mortality and whether the observed effects of Islamic rule are larger for these populations. The results show that the infant mortality risk is indeed higher in the Eastern region. While the interaction coefficients are all negative, we fail to reject that they differ from zero. Hence, we find limited evidence that Islamic rule helped mitigate the adverse effects of regional or ethnic disparities.

Since the Islamic rule may involve a bundle of treatments affecting local labor markets, we test whether the labor market outcomes of those living in municipalities that barely elected an Islamic mayor in a close election exhibit any significant changes after the election. The bundle of treatments could include investments of Islamic mayors in other sectors that can expand employment opportunities in local labor markets. Appendix Table B.19 reports the RD treatment effects on labor market outcomes of respondent women. The findings show no evidence of a significant change in the probability of agricultural employment, non-agricultural employment, or any employment for the respondent women in treated municipalities compared to women in control municipalities.

Finally, another channel through which Islamic rule may affect child health is selective migration, which could occur if municipalities with an Islamic mayor attracted higher income or more educated parents with greater ability to prevent infant deaths. Panel A of Appendix Table B.20 shows that there were no statistically significant population changes for the municipalities that barely elected an Islamic mayor compared to the municipalities that did not. More specifically, the first two columns show no evidence of a significant RD treatment effect in the municipality population change from 1990 to 2000 using Census data, or from 1994 to 1999 using the number of registered voters as a proxy for population. Using the 2003 DHS data, we also find no evidence of a significant change in the share of mothers who have moved over the last 10 years, implying that since 1993, there does not seem to be differential migration to areas with an elected Islamic mayor.

Moreover, the increased forced migration of Kurdish population from the Southeast and Eastern areas in the 1990s might have led to a decline in demand for healthcare services in these areas, which could impact the infant health outcomes if the treated municipalities are mostly in these areas. To account for this potential concern, we test whether there is differential migration from the Eastern region—including Southeast and Eastern parts of Turkey—in municipalities where an Islamic mayor is barely elected using the DHS data. The results reported in panel B of Appendix Table B.20 indicate no evidence of a significant change in the probability of having moved in

the past 10 years and currently not residing in the Eastern region, or the probability of having moved in the past 10 years and currently residing in the Eastern region. Overall, we conclude that selective migration does not explain our results.

6 Conclusion

We investigated whether Islamic mayors in Turkey have had a significant impact on early child health through increased healthcare investment. Exploiting exogenous variation in having an Islamic mayor, we find that treated municipalities experienced substantial reductions in infant mortality in Turkey. These findings not only underscore the direct benefits of increased healthcare investments but also highlight the potential for local government policies to significantly influence public health outcomes. The substantial enhancements in healthcare infrastructure—marked by an increase in the number and size of healthcare facilities—are crucial in advancing infant survival rates.

Furthermore, our study reveals that improvements in health-seeking behaviors, such as increased births in government facilities, enhanced treatment for common illnesses, more comprehensive vaccination coverage, and increased prenatal care visits, are integral to the observed health benefits. This suggests that policy interventions that focus on both enhancing healthcare infrastructure and promoting positive health behaviors can be particularly effective.

Given these insights, policymakers, particularly in regions facing similar public health challenges, might consider prioritizing investments in healthcare facilities and actively promoting policies that foster improved health behaviors. This approach could be particularly beneficial in disadvantaged areas where access to quality healthcare is often limited, thereby potentially replicating the positive outcomes observed in our study. By emphasizing the tangible benefits of targeted healthcare investments and informed policy-making, our research contributes to a deeper understanding of how to effectively tackle health disparities, ultimately paving the way for more resilient public health systems worldwide.

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Data Availability Program files to replicate the results presented in the paper are available on request from the corresponding author.

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